THE

Malayan Agricultural Journal.

FEBRUARY, 1936.

EDITORIAL.

Experiments with Padi.

It has been customary to devote one number of this Journal each year to a detailed review of the rice experiments conducted throughout Malaya during the previous season, together with an account of the economics of the rice supplies during the past year.

On the present occasion we propose to deviate from the usual course, because the magnitude of the task would render this number too bulky and would infer a completeness to which in fact it could lay no claim. No special "rice number" would be complete without inclusion of an account of the progress of the work of the Drainage and Irrigation Department, besides more than passing reference to the work of administrative officers, performed through local economic boards, committees and the local headmen, and to other Departments of Government Service which exercise their influence in different spheres of activity.

Consequently, in the present number, we content ourselves with a presentation of the work of the Department of Agriculture on selection and varietal trials and on the manurial and cultural experiments which have been conducted during the year 1935, and a review of the rice situation in Malaya in 1935.

The rice experiments in Malaya have now advanced to a stage in which the position may appear somewhat complex. Selection work has been continued over a number of years, and the Department has now procured a number of varieties of padi which, under the conditions suitable for each variety, will produce high yields of rice with desirable milling and other qualities. The aim, therefore, is eventually to possess a suitable variety of padi for each main area of padi land. The needs of each district vary considerably; its soils, length of season in which water is obtainable, amount of water;—these factors and others must be taken into consideration in the evolution of suitable types of padi for each set of conditions.

Having evolved the padi variety suitable for a given district, it becomes necessary to persuade the cultivators to adopt it. This, admittedly, is frequently a difficult problem, but patience, demonstration and education are gradually breaking down the barriers, and reports from all the more important centres of rice production refer to the growing popularity of the improved

varieties, the increasing adoption of which is becoming more evident in the heavier yields obtained by the cultivators.

The importance of the industry to the country is fully recognized by the Government, and received emphasis by the appointment in August last of three officers to deal solely with problems arising out of the production of this crop.

While these officers will work on problems related to soils, botany and entomology, the Field Branch of the Department will remain responsible for the general supervision of the rice experiment stations and the carrying out of manurial, cultural and other experiments. Close collaboration between the investigators is effected through the Chief Research Officer and the Chief Field Officer.

It is probable that this re-organization of the investigations will result in a considerable advance of our knowledge of the requirements of the padi crop, which should result, not only in an increase of the area available for its cultivation, but in rendering the crop more profitable—and therefore more popular—amongst the Malay cultivators.

Original Articles.

RICE IN MALAYA IN 1935

BY

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Prices.

The price of rice appreciated considerably during 1935, the average wholesale price by 32 per cent., and the retail by 12 per cent. in comparison with the previous year. Production and stocks in rice-producing countries appear to have been normal, increased prices probably being due less to the stock position than to the improved purchasing power of the consumer coupled possibly with increased handling charges. There was no material change in freight charges to Malaya and no change in local railway rates on rice.

During the latter part of the year the Italian-Abyssinian war, and fears of the widening of the sphere of war, caused a sharp rise in the price of rice owing to the tendency in various countries to ensure adequate stocks. The higher level, however, was not maintained.

The Customs import duty on imports of rice into the Federated Malay States, which was brought into force on 17th October, 1933, was removed on 1st May 1935. The tax was 15 cents per picul of rice, equal to $2.52 per ton. On account of the rising market at the time, the removal of the tax was not noticeably reflected in the retail price of the commodity.

The price of rice has shown considerable fluctuations during the past twelve years. From 1923 to 1929 inclusive, the average wholesale price of Siam No. 2 was $10.10 per picul. In 1930 it dropped to $6.60; thereafter the price steadily declined to $2.91 in 1934, rising to an average of $3.98 in 1935. Rangoon and Saigon rice shewed fluctuations of a similar order.

Details of wholesale and retail prices are stated in Table I.

Imports and Exports.

A statement of the total annual imports and exports of rice with values, for the past seven years, is given in Table II. It will be seen that, in comparison with the previous year, the net imports of rice in 1935 increased by 5 per cent. in quantity, while the cost was $4,849,809 or 20 per cent. greater.

The different grades of rice imported in 1935 were as follows (net imports only are given) :—cargo rice 22,062 tons, parboiled 41,698 tons, white rice 342,635 tons, broken 63,989 tons.

Table I.

Average Prices of Rice and Padi in Malaya, 1935.

Month	Wholesale Price of Rice (Dollars per picul of 133.3 lbs.)			Retail Prices of Rice (Cents per Gantang (Gallon)).			Price of Padi per Picul at Government Rice Mill, Bagan Serai.
	Siam No. 2 (ordinary)	Rangoon No. 1	Saigon No. 1	Singapore	Penang	Malacca	
January ...	3.11	2.89	3.02	22	20	22	1.50
February ...	3.37	3.16	3.32	23	20	22	2.00
March ...	3.77	3.43	3.55	27	20	24	2.00
April ...	3.97	3.41	3.87	28	20	26	1.80
May ...	4.77	3.77	4.05	32	20	30	1.90
June ...	4.34	3.72	3.87	32	23	30	1.90
July ...	4.22	3.77	3.87	32	23	29	2.00
August ...	4.05	3.65	3.62	32	23	29	2.00
September	4.29	3.72	3.77	32	26	29	2.00
October ...	4.37	3.86	3.82	32	32	29	2.00
November	3.89	3.74	3.55	31	31	27	2.20
December	3.62	3.57	3.32	32	30	27	2.00 Nom.
Average for 1935	3.98	3.60	3.64	30	24	27	1.94
Average for 1934	2.91	2.76	2.81	23	24	24	1.42

Table II.

Rice: Malayan Imports and Exports.

Year	Imports		Exports		Net Imports	
	Tons	Value $	Tons	Value $	Tons	Value $
1929	785,558	95,461,036	233,897	28,031,407	551,661	67,429,629
1930	800,443	87,666,723	208,688	23,361,561	591,755	64,305,162
1931	691,112	48,458,102	175,385	13,453,189	515,727	35,004,913
1932	592,209	39,632,925	183,209	12,660,493	409,000	26,972,432
1933	592,912	33,846,158	159,746	9,493,291	433,166	24,352,867
1934	619,199	32,813,558	165,968	8,609,566	453,231	24,203,992
1935	660,020	40,114,794	185,065	11,060,993	474,955	29,053,801

In addition, the net imports of bran, rice flour, and rice meal were 134,722 tons, valued at $3,634,402, as compared with 127,730 tons valued at $3,106,289 in 1934. Adding this product, most of which is used for human consumption, to the above-mentioned imported rice products, the total quantity of rice products imported for local consumption in the year under review amounts to the very large figure of 609,677 tons, valued at $32,688,203 as compared with 580,961 tons, valued at $27,310,281 in 1934. The above does not take into account the net imports of padi, which in 1935 amounted to 5,176 tons, valued at $167,162.

The rice supplies (gross imports) were obtained from the following sources: Siam 397,767 tons (60.7 per cent.), Burma 210,655 tons (32.2 per cent.), French Indo-China 39,338 tons (6 per cent.), other countries 7,084 tons (1.1 per cent.). Of the total imports, 342,502 tons (52.3 per cent.) were consigned to Singapore, 106,929 tons (16.3 per cent.) to Penang, 41,897 tons (6.3 per cent.) to Malacca, 127,452 tons (19.6 per cent.) to the Federated Malay States, and 36,064 tons (5.5 per cent.) to the Unfederated Malay States.

Area Planted.

Early in the season, weather conditions in several areas gave rise to considerable anxiety, particularly in Kedah and the riverine mukims of Perak. In the latter area little damage was done to the crops, but in Kedah heavy floods destroyed the newly planted crop over considerable areas. Replanting became necessary in several places, the Department of Agriculture rendering assistance by the distribution of seedlings. Despite their efforts, nearly 5,000 acres of padi-land failed to reach maturity.

The planted area of "wet" padi was less than in the previous season in all States with the exception of Trengganu, due very largely to the improved economic conditions. The total area planted (669,290 acres) was 4.6 per cent. less than in the season 1933-34.

"Dry" padi cultivation declined from 14,300 acres in the Federated Malay States to 5,160 acres. In the Unfederated Malay States it was fully maintained, being less in Johore, Kedah and Kelantan, but greater in Trengganu.

A summary of the areas and production of padi for the past six seasons is given in Table III.

Production of Padi.

The production of padi per acre in the 1934-35 season compares very favourably with that of the previous season. Comparisons in this respect are difficult as the methods of computation are imperfect. The total estimated yield of wet padi in 1934-35 season was approximately the same as in the previous season, indicating an increased yield per acre, due in large measure to the favourable season, more efficient water control and the extended use of improved seed. The yield of "dry" padi was less favourable than in the previous season, but the total area is not sufficiently large as materially to affect the total production.

Table III.

Areas and Yields of Padi.

Year	"Wet" Padi			"Dry" Padi			Total	
	Area Acres	Yield Gantangs	Gantangs Per Acre	Area Acres	Yield Gantangs	Gantangs Per Acre	Area Acres	Yield Gantangs
1929-30	629,650	103,624,000	164	27,550	3,160,000	114	657,200	106,784,000
1930-31	603,070	166,845,000	277	104,670	9,122,000	87	707,740	175,967,000
1931-32	635,130	184,631,000	291	89,850	12,472,000	139	724,980	197,103,000
1932-33	674,920	186,345,000	276	91,990	13,416,000	146	766,910	199,761,000
1933-34	691,110	215,098,000	311	74,140	9,389,000	127	765,250	224,487,000
1934-35	669,290	213,835,000	319	65,440	6,720,000	106	734,730	220,555,000

(Acreage to nearest 10 acres: yields to nearest 1,000 gantangs)

The total production of rice (both from the "wet" and "dry" systems of cultivation) is given in Table IV and shews that the crop was but a little less than that reaped in the record season 1933-34.

Table IV.

Area of Land Planted in Malaya and Yield of Rice.

Season	F.M.S.		S.S.		U.M.S.		Total	
	Area Acres	Production Rice Tons	Area Acres	Production Rice Tons	Area Acres	Production Rice Tons	Area Acres	Production Rice Tons
1929-31	174,466	47,153	67,005	24,830	415,727	74,985	657,198	152,549
1930-31	178,930	54,257	67,350	37,584	461,460	159,540	707,740	251,381
1931-32	194,580	64,371	67,980	37,701	462,420	179,503	724,980	281,575
1932-33	214,160	72,624	70,530	34,300	482,220	178,449	766,910	285,373
1933-34	195,690	75,006	70,550	42,034	499,010	203,656	765,250	320,696
1934-35	176,750	75,694	68,500	41,851	489,480	197,533	734,730	315,078

(Yield estimated on a basis of 700 gantangs of padi = 1 ton of rice).

The detailed returns from each State are stated in Table V.

Table V.

Area of Land planted in Malaya and Yields of Padi

Season 1934-1935.

State or Territory	Wet		Dry		Total	
	Acres	Gantangs	Acres	Gantangs	Acres	Gantangs
F.M.S.						
Perak ...	89,770	29,347,000	3,220	315,000	92,990	29,662,000
Selangor ...	15,460	4,222,000	730	106,000	16,190	4,328,000
N. Sembilan ...	33,550	10,553,000	230	17,000	33,780	10,570,000
Pahang ...	32,810	8,273,000	980	153,000	33,790	8,426,000
Total ...	171,590	52,395,000	5,160	591,000	176,750	52,986,000
S.S.						
P. Wellesley ...	32,500	13,598,000	570	112,000	33,070	13,710,000
Malacca ...	31,360	13,231,000	—	—	31,360	13,231,000
Penang ...	4,070	2,355,000	—	—	4,070	2,355,000
Total ...	67,930	29,184,000	570	112,000	68,500	29,296,000
U.M.S.						
Johore ...	9,630	1,331,000	2,040	194,000	11,670	1,525,000
Kedah ...	235,580	89,942,000	3,190	629,000	238,770	90,571,000
Perlis ...	40,590	9,482,000	—	—	40,590	9,482,000
Kelantan ...	108,740	25,643,000	31,170	3,961,000	139,910	29,604,000
Trengganu ...	35,230	5,858,000	23,310	1,233,000	58,540	7,091,000
Total ...	429,770	132,256,000	59,710	6,017,000	489,480	138,273,000
Total Malaya ...	669,290	213,835,000	65,440	6,720,000	734,730	220,555,000

Note :—Acreage to the nearest 10 acres.

Yield to the nearest 1000 gantangs.

Consumption compared with Production.

The favourable crops reaped during the past three seasons have stabilized the percentage of production to consumption at about 40 per cent. Consumption in 1935 was about 16,000 tons greater than in the previous year, and about 100,000 tons (14 per cent.) greater than in 1932. That increased production should have been able to maintain the balance between imports and consumption is an achievement. In his last year's review of the situation the writer stated: "With the improvement in trade conditions it cannot be expected that this ratio can be maintained. Consumption is bound to increase still further, and there is difficulty in some districts in mantaining the planted area in view of the attraction which rubber tapping has for the small-holder". The consumption has indeed increased, and the planted area decreased. Increased cost of rice may stimulate local production in some areas. Given a good season in 1935-36, there appears no reason to believe that the ratio of production to consumption or to imports will materially alter, and there appears no reason to believe that the imports of rice in 1936 will show any great increase over those of 1935.

Table VI.
Malayan Production of Rice in Relation to Net Imports and Consumption 1929-1935.

	1929	1930	1931	1932	1933	1934	1935
Net imports (tons) ...	551,661	591,755	515,727	409,000	433,166	453,229	474,955
Production (tons) ...	180,328	152,549	251,381	281,575	285,373	320,696	315,078
Consumption (tons) ...	731,989	744,304	767,108	690,575	718,539	773,925	790,033
Percentage of production to net imports ...	33	26	49	69	66	71	66
Percentage of production to consumption ...	25	20	33	40	40	41	40

Acknowledgments.

The Field Branch of the Department of Agriculture, in collaboration with the Land Officers, were responsible for the estimates of areas and yields as summarized in Table V. The figures for imports and exports, and values thereof, are obtained from the Monthly Summary of Imports and Exports, published by the Statistics Department, Straits Settlements and Federated Malay States, and are subject to minor adjustments at a later date.

PADI SELECTION AND VARIETAL TRIALS 1934-1935.

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Introduction.

This report summarizes the results of selection work and yield trials carried out by the Field Branch of the Department of Agriculture at the various padi stations and test plots in Malaya. Statistical analysis of the results was made by the Research Branch.

During the year under review, five main experiment stations and twenty-eight test plots were maintained by the Department. In addition, two test plots were maintained by the Government of Perlis. At least one station or test plot is situated in each of the important rice-growing districts in the country. The table on the next page, together with the map, shows the distribution of the stations and plots. (One test plot in Brunei is not shown in the map). Results from experiments in the Unfederated States are included by courtesy of the Governments concerned.

The standardized procedure of the previous year* was continued and the general adoption of Latin Squares facilitated the accurate comparison of yields of the strains under trial.

Minimum significant differences—between any two plots—throughout the report are estimated on a basis of Fisher's "t" test for 5 per cent. points. That is to say, the chances of one variety being superior to another in cases where "significance" occurs are at least ninety-five in one hundred.

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* See Report in *Malayan Agricultural Journal* Vol. XXIII, No. 1, January 1935.

The following abreviations are used throughout this report:—

Standard Deviation (S.D.)

Minimum Significant Difference (M.S.D.)

B	—	Bujang.	R.C.	—	Radin China.
F.S.	—	Foundation Stock.	R.S.	—	Radin Siak.
M.E.	—	Mayang Ebus.	Rey.	—	Reyong.
M.K.	—	Milek Kuning.	Sm.	—	Siam.
M.P.	—	Milek Puteh.	S.B.	—	Seraup Besar.
N.	—	Nachin.	S.K.	—	Seraup Kechil.
R.	—	Radin.	Sr.	—	Serendah.

Distribution of Rice Experiment Stations and Test Plots.

Name of Station or Test Plot.	State.	Locality.
Seriab	Perlis	Kangar
Kampong Salang	„	„
Telok Chengai Experiment Station	Kedah	Alor Star
Langgar Test Plot	„	District of Kota Star North
Jitra Test Plot	„	„ Kubang Pasu
Rantau Panjang Test Plot	„	„ Kuala Muda
Pulai Test Plot	„	„ Baling
Glugor Test Plot	Penang	
Bukit Merah Test Plot	Province Wellesley	South West District
Titi Serong Experiment Station	Perak	District of Krian.
Kuala Kurau Test Plot	„	„ „
Bagan Serai Test Plot	„	„ „
Briah Test Plot	„	„ „
Selinsing Test Plot	„	„ „
Bukit Gantang Test Plot	„	„ Larut
Lenggong Test Plot	„	„ Upper Perak
Bruas Test Plot	„	„ Bruas
Talang Experiment Station	„	„ Kuala Kangsar
Sungei Tontong Test Plot	„	„ Dindings
Panchang Bedena Test Plot	Selangor	„ Kuala Selangor
Sungei Haji Durani Test Plot	„	„ „
Tanjong Karang Test Plot	„	„ „
Kuang Test Plot	„	„ Ulu Selangor
Kajang Test Plot	„	„ Ulu Langat
Kuala Klawang Test Plot	Negri Sembilan	„ Jelebu
Kendong Test Plot	„	„ Tampin
Pulau Gadong Experiment Station	Malacca	Central District
Temerloh Test Plot	Pahang	District of Temerloh
Dong Test Plot	„	„ Raub
Kuala Lipis Test Plot	„	„ Lipis
Sungei Blat Test Plot	„	„ Kuantan
Pekan Test Plot	„	„ Pekan
Central Experiment Station	Kelantan	„ Kota Bahru
Pasir Puteh Test Plot	„	„ Pasir Puteh
Kilanas Test Plot	Brunei	Borneo.

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PADI EXPERIMENT STATIONS AND TEST PLOTS.
PADI EXPERIMENT STATIONS
PADI TEST PLOTS
6°
5°
4°
PERLIS
KG. SALANG
SERIAB
JITRA
LANGGAR
TELOK CHENGAI
SIAM
KOTA BAHRU
KEDAH
PASIR PUTEH
RANTAU PANJANG
PULAI
PERAK
PENANG
BUKIT MERAH
GLUGOR
LENGGONG
KELANTAN
KUALA KURAU
TITI SERONG
BRIAH
BAGAN SERAI
SUNGEI KEPAH
SELINSING
TRENGGANU
TALANG
BUKIT GANTANG
SUNGEI TONTONG
BRUAS
KUALA LIPIS
DONG
PAHANG
SUNGEI BLAT
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SG. HAJI DURANI
TANJONG KARANG
TEMERLOH
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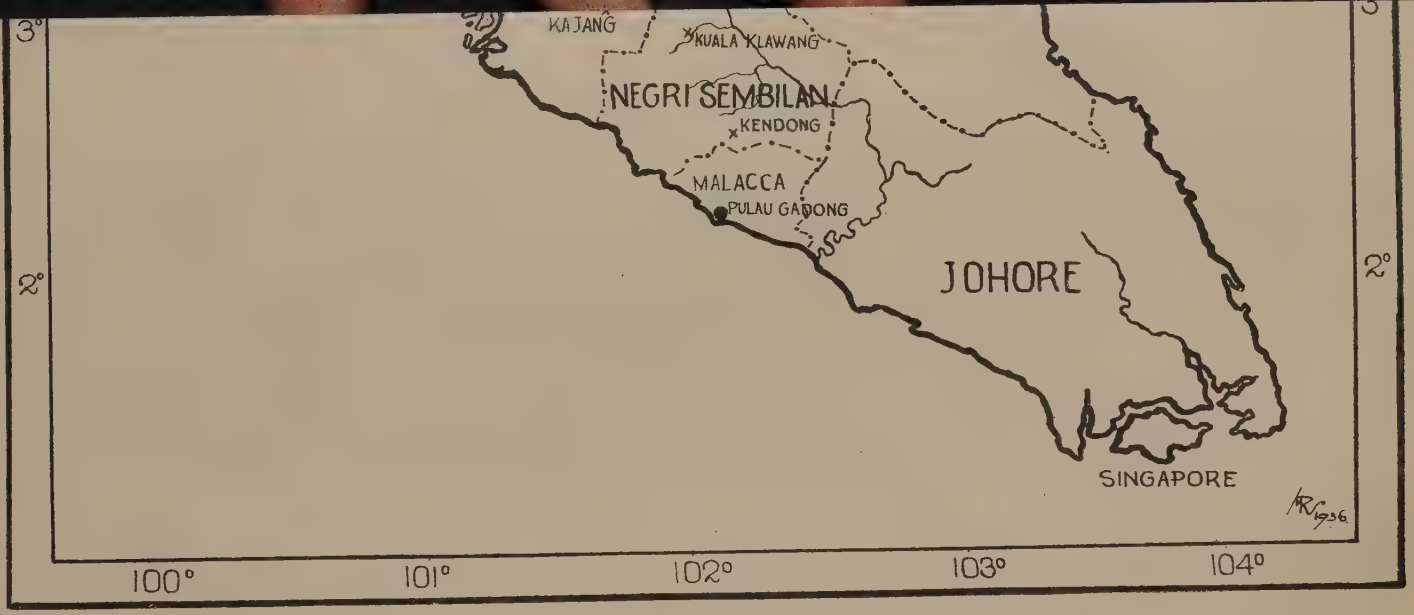
KAJANG
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Perlis.

Test plots at Seriab and Kampong Salang, both situated within a few miles of Kangar, were maintained by the Government of Perlis under the supervision of a Malay Padi Inspector. Trials in randomized blocks with four replications of each variety were carried out between local unselected varieties and pure strains selected elsewhere in Malaya. The results obtained are shown below.

Table I.

Seriab.		Kampang Salang	
Variety	Mean yield per 1/45th acre in gantangs.	Variety	Mean yield per 1/45th acre in gantangs.
Sm. 29 ...	12.75	R. Seroja (local)	11.17
Sm. 76 ...	12.50	R. Kamuja (local) (3 plots only)	12.47
N. 10 ...	12.81	Sm. 29 ...	14.26
M.E. (local) ...	11.38	R. Pulau (local)	12.73
Rey. 20 ...	14.19	N. 10 ...	14.43
Tok Awang (local) ...	12.90	M. Batil (local)	12.67
Mean ...	12.75	Mean ...	12.96
S.D. 2.01 gantangs (15.7% of mean) M.S.D. 2.9 gantangs.		Owing to the loss of crop from one plot, these results were not analysed.	

Kedah.

The station at Sala Kanan was abandoned owing to difficulties of water control. In addition to the Experiment Station at Telok Chengai, test plots situated respectively at Langgar, Jitra, Rantau Panjang, and Pulai were maintained during the season.

Teloh Chengai Experiment Station.

Selection.—The selection work started in the 1931-32 season was continued. Seventy lines of the local variety To' Seman were grown for the second season, and preliminary selections were made from a four-month Indian variety 'Kalyaman' (obtained from Trinidad) and from the two local varieties 'Nakon' and 'Kala'.

Of the earlier local selections, those shown in Table II have proved their worth and may be regarded as "final selections".

Table II.

Strain.	Average yield per plant for the four seasons ending 1934-35.
	grammes
Chubai 18 ...	100.02
M.E. 88 ...	118.03
Radin Che Nah 28 ...	115.78
R.C. 4 ...	111.85
R.C. 17 ...	115.38
Rey. 20 ...	116.18

Selected strains imported from other districts in Malaya have been grown in pure lines for several seasons and the mean weight of grain per plant calculated. Table III shows the mean weight yielded by these strains during the last four seasons. It will be noted that Seraup Kechil 48 gives an outstandingly high yield per plant, but this strain, having a comparatively long maturation period (7 to 7½ months), is unsuitable for normal conditions in Kedah owing to the limited period during which sufficient water is available.

Table III.

Strain.	Average yield per plant for the four seasons ending 1934-35.
	grammes
N. 10 ...	111.83
Sm. 29 ...	109.34
S.K. 48 ...	124.29
S.B. 15 ...	91.25

Varietal Trial.—Certain previous selections were grown in a six-way Latin Square, the size of the plots being 22 ft. x 22 ft. or 1/90th acre. The results of this experiment are shown in Table IV.

Table IV.

Mean Yield per Plot of 1/90th acre in pounds.

Station.	M.E. 88	R.C. 17	Rey. 20	M.E. 90	R.C. 16	Rey. 49
Telok Chengai ...	43.25	44.21	42.1	41.9	45.4	42.7
Mean 43.23 lbs.						
S.D. 1.77 lbs. (4.6% of mean) M.S.D. 2.42 lbs.						

Multiplication.—Twenty-five large plots of imported and local selections were established for supply of seed for distribution and for comparative purposes. There were considerable losses from these plots through accidental causes (chiefly storms and unavoidable delay in harvest) but yields as recorded in Table V were generally satisfactory.

Table V.

Calculated Yield per acre of Large Plots for Local and Imported Selected Varieties.

Variety.	Yield per acre in gantangs.
N. 10 (Malacca) ...	508
Sm. 29 „ ...	563
Sm. 76 „ ...	553
S.K. 48 (Krian) ...	533
S.B. 15 „ ...	445
Sr. 824 „ ...	468
Rey. 6 (Kedah) ...	514
Rey. 20 „ ...	536
M.E. 88 „ ...	461
R.C. 4 „ ...	632
Radin Che Nah 28 (Kedah)	545
Chubai 18 (Kedah) ...	514

Langgar Padi Test Plot.

At this Station four selected varieties and one unselected local variety were tested against each other in a five-way Latin Square, each plot having an area of 1/120th acre. A slight modification of the square was necessary to overcome possible residual manurial effects on a portion of the land which was manured with local guano in the previous season. Table VI shows a summary of the yields recorded.

Table VI.

	N. 10	Sm. 29	Sm. 76	R.S. 7	To' Seman	Mean.
Mean yield per plot of 1/120th acre in lbs. ...	26.46	26.09	23.66	20.15	19.96	23.26

Statistical analysis showed Siam 29, Siam 76, and Nachin 10 to be superior in yield to Radin Siak 7 and the unselected To' Seman.

For comparative purposes a second yield trial of the four selected varieties Nachin 10, Siam 29, Siam 76 and Radin Siak 7 was laid down on a randomized block plan with plots of 1/45th acre. It was shown that a higher degree of accuracy was obtainable with smaller plots and a Latin Square arrangement, as field and harvesting losses are higher in the larger plots.

Table VI (a) shows the comparative yields calculated in gantangs per acre from plots of 1/120th and of 1/45th acre.

Table VI (a)

Strain.	A. Calculated yield per acre from 1/120th acre plots in gantangs.	B. Calculated yield per acre from 1/45th acre plots in gantangs.	Difference between A. and B.	Difference as Percentage of B.
Sm. 29 ...	592	450	142	32
N. 10 ...	577	405	172	42
Sm. 76 ...	489	401	88	22
R.S. 7 ...	415	373	42	11

Jitra Padi Test Plot.

In spite of damage from flooding by the Jitra River and of damage by rats to the comparatively early strain Reyong 20, exceptionally heavy yields (recorded in Table VII) were obtained at this Station. The plots were irrigated, and manured with local guano at a rate of 1,000 lbs. per acre, one month after planting.

Table VII.

	M.E. 88	Sm. 76	R.C. 4	Rey. 6	Rey. 20	M.E. 80
Calculated yield per acre in gantangs. ...	748	723	675	650	599	585
Calculated yield per acre in lbs. ...	4092	4034	3841	3678	3391	3346

Pulai Padi Test Plot.

A satisfactory season was experienced at this Plot where Siam 29, Siam 76, Reyong 20 and Nachin 10 were planted in a randomized block with four replications of 1/45th acre of each variety. The high yields of Siam 29 and Siam 76 are noteworthy.

Table VIII shows the calculated yields obtained.

Table VIII.

	Sm. 29	Sm. 76	Rey. 20	N. 10
Calculated yield in gantangs ...	698	641	602	557
Calculated yield per acre in lbs. ...	3865	3540	3353	2862

Rantau Panjang Padi Test Plot.

Although flooding caused complete submergence of the growing crop for several days on two occasions, recovery was good and very satisfactory yields were obtained. Five selected varieties together with a popular local unselected variety (Anak Kuching) were planted in a randomized block, each variety being represented by six replications of plots, each of 1/45th acre in area.

Table IX shows the calculated yields obtained.

Table IX.

	Sm. 76	Sm. 29	N. 10	Rey. 20	Rey. 6	Anak Kuching (unselected)
Calculated yield per acre in gantangs ...	685	682	679	657	613	585
Calculated yield per acre in lbs. ...	3808	3660	3608	3737	3483	3226

Penang and Province Wellesley.

Glugor Padi Test Plot *(Penang.)*

As in past years this Station suffered somewhat from flood damage and stem borers. The programme included four varietal trials arranged in Latin Squares, and preliminary selection of a good local variety known as Sebatil. In the first square (8 months varieties) Seraup Kechil 36 proved significantly superior to the other varieties, while in the second square Nachin 66 was shown to be significantly superior to the other varieties with which it was compared. Table X shows the yields obtained and significant differences.

Table X.

Square A.		Square B.	
Variety.	Mean Yields in lbs. per 1/120th acre.	Variety.	Mean Yields in lbs. per 1/120th acre.
S.K. 36 ...	18.9	Sm. 29 ...	15.1
S.K. 48 ...	16.2	R. 2 ...	14.4
S.K. 68 ...	8.5	N. 66 ...	18.5
Sebatil ...	16.6	R. 4 ...	15.5
Mean ...	15.1	Mean ...	15.9
S.D. 1.25 lbs. (8.3% of mean) M.S.D. 2.17 lbs.		S.D. 1.74 lbs. (9.1% of mean) M.S.D. 3.03 lbs.	

Square C.		Square D.	
Variety.	Yields in lbs. per 1/120th acre.	Variety.	Yields in lbs. per 1/120th acre.
Sr. 824 ...	21.7 (3 plots only)	Sm. 29 ...	15.6
M.E. 203 ...	15.8	R.S. 18 ...	18.0
M.E. 202 ...	17.1 (3 plots only)	R.S. 34 ...	15.0
N. 756 ...	17.3	R.S. 17 ...	17.3
Mean ...	18.0	Mean ...	16.5
Owing to flood damage, no crop was reaped from two plots. The results were therefore not analysed.		S.D. 1.33 lbs. (8.0% of mean) M.S.D. 2.3 lbs.	

Bukit Merah Padi Test Plot *(Province Wellesley.)*

The programme of this Station consisted of multiplication of the selected strains Siam 29, Mayang Ebus 203, Seraup Kechil 48 and Seraup 15; of further selection of the local variety Mayang Ebus; and of five four-way Latin Squares for varietal trials.

The results of these varietal trials (shown below in Table XI) indicate—with due consideration to performance during several successive seasons—that Siam 29, with a calculated mean yield over the past four seasons of 433 gantangs per acre, may be confidently recommended for the Central District of the Province. Mayang Ebus 203 with a calculated mean yield per acre of 381 gantangs during the last three seasons may also be recommended for distribution in this District and in the shallow water areas of Province Wellesley North.

Table XI.

Square A.		Square B.	
Variety.	Mean yield per 1/120th acre in lbs.	Variety.	Mean yield per 1/120th acre in lbs.
Rey. 20 ...	13.6	Sm. 29 ...	15.8
R.C. 4 ...	16.4	N. 66 ...	14.3
Rey. 6 ...	15.4	Sr. 824 ...	14.5
Rey. (local) ...	14.5	N. 756 ...	15.3
Mean ...	15.0	Mean ...	15.0
S.D. 1.5 lbs. (10.0% of mean) M.S.D. 2.6 lbs.		S.D. 0.82 lbs. (5.5% of mean) M.S.D. 1.42 lbs.	

Square C		Square D	
Variety.	Mean yield per 1/120th acre in lbs.	Variety.	Mean yield per 1/120th acre in lbs.
Sm. 29 ...	16.4	Sm. 29 ...	14.3
N. 66 ...	14.5	N. 66 ...	15.4
M.E. 203 ...	15.9	M.E. 88 ...	15.6
F.S. 63 ...	14.1	Rey. 20 ...	12.1
Mean ...	15.2	Mean ...	14.4
The differences between the means observed cannot be considered significant on statistical analysis.		No analysis of these figures was made as they are very regular and Rey. 20 is obviously inferior.	

Square E.		
Variety.	Mean yield per 1/120th acre in lbs.	Remarks.
M.E. 203 ...	21.1	This square was not analysed as the minimum difference between means is 2 lbs. only. There were several poor plots of M. E. 88 and M. E. (local).
M.E. 210 ...	20.1	
M.E. 88 ...	19.1	
M.E. 80 ...	21.1	
M.E. (local) ...	19.3	
Mean ...	20.1	

Perak.

Titi Serong Experiment Station.

A fairly satisfactory season was experienced at this Station, though the crop generally was not so good as in the previous season (1933-34). Heavy flooding occurred early in September followed by drought at the critical time of flowering early in December.

Selection work was continued on strains of comparatively long maturation period. The strains with shorter maturation periods, previously under selection here, have been moved to Talang Station (Kuala Kangsar) where conditions are more suitable. Strains grown for observation and selection during the season included Mayang Kuning (selections from Kuala Kangsar and Province Wellesley), Mayang Ebus (Province Wellesley), Bujang (local), Mayang, Serbok Mas and Tongkat (from Batu Kurau, Larut) and Seri Menjadi (local). The Kelantan selections (Kemasing and Anak China) proved disappointing in yield trials in spite of a good performance when grown in pure line, and further work on them is not contemplated.

Hybrids.—Twenty-seven lines of hybrids now in the fourth generation were raised, and comprised seventeen lines of the progeny of Radin 2 x Seraup Kechil 36 and ten lines of the progeny of Radin 2 x Nachin 27. During the season five lines were discarded leaving a balance of twenty-two for further observation.

Varietal Trials.—Nine four-way Latin Squares (with sub-plots of 1/120th acre) were established to test comparative yields of selected strains. The results are summarized in Table XII.

Table XII.

Square A.		Square B.	
Variety.	Mean yield per 1/120th acre in lbs.	Variety.	Mean yield per 1/120th acre in lbs.
S.K. 36 ...	21.4	S.K. 36 ...	20.2
S.K. 371 ...	27.1	S.K. 371 ...	26.5
S.K. 48 ...	21.7	S.K. 48 ...	22.3
S.K. 146 ...	30.1	S.K. 146 ...	28.5
Mean ...	25.2	Mean ...	24.4
S.D. 2.38 lbs. (9.4% of mean) M.S.D. 4.14 lbs.		S.D. 1.22 lbs. (5.0% of mean) M.S.D. 4.14 lbs.	

Squares A and B combined		Square C.	
Variety.	Mean yield per 1/120th acre in lbs.	Variety.	Mean yield per 1/120th acre in lbs.
S.K. 36 ...	20.8	S.K. 48 ...	22.1
S.K. 371 ...	26.8	S.B. 15 ...	23.2
S.K. 48 ...	22.0	S.K. 6 ...	22.8
S.K. 146 ...	29.3	S.K. 68 ...	22.0
Mean ...	24.7	Mean ...	22.5
S.D. 1.37 lbs. (5.5% of mean) M.S.D. 1.48 lbs.		This square was not analysed as there is obviously no significant difference between means.	

Square D.		Square E.	
Variety.	Mean yield per 1/120th acre in lbs.	Variety.	Mean yield per 1/120th acre in lbs.
R. 4 ...	18.9	R. 4 ...	17.8
R. 13 ...	21.0	R. 16 ...	13.3
R. 7 ...	19.7	R. 1 ...	17.3
R. 11 ...	19.5	R. 2 ...	14.8
Mean ...	19.7	Mean ...	15.8
S.D. 2.07 lbs. (10.5% of mean) No significant difference.		S.D. 1.59 lbs. (10.1% of mean) M.S.D. 2.76.	

Square F.		Square G.	
Variety.	Mean yield per 1/120th acre in lbs.	Variety.	Mean yield per 1/120th acre in lbs.
M.E. 209 ...	19.2	B. 215 ...	22.5
M.E. 210 ...	21.2	B. 216 ...	22.3
M.E. 208 ...	20.8	B. 213 ...	22.0
M.E. 203 ...	20.8	B. 212 ...	22.2
M.E. 202 ...	22.1	B. 211 ...	23.0
Mean ...	20.8	Mean ...	22.4
S.D. 1.51 (7.2% of mean) M.S.D. 2.21 lbs.		Not analysed. No significant difference between means.	

Square H. (Kelantan varieties)		Square K.	
Variety	Mean yield per 1/120th acre in lbs.	Variety	Mean yield per 1/120th acre in lbs.
F.S. 369 ...	23.9	F.S. 48 ...	26.4
F.S. 397 ...	20.3	F.S. 55 ...	22.9
F.S. 346 ...	15.4	F.S. 42	22.4
F.S. 341 ...	13.0	F.S. 39 ...	22.8
F.S. 331 ...	20.3	S.K. 48 ...	18.9
Mean ...	18.6	Mean ...	22.7
S.D. 1.77 lbs. (9.5% of mean) M.S.D. 2.58 lbs.		S.D. 2.30 lbs. (10.1% of mean) M.S.D. 3.36 lbs.	

Kuala Kurau Test Plot.

In spite of several periods when weather conditions were unfavourable, a satisfactory crop was obtained at this plot. The programme consisted of four varietal trials of long-term varieties arranged in four-way Latin Squares. The results are shown in Table XIII.

Table XIII.

Square A.		Square B.	
Variety	Mean yield per 1/120th acre in lbs.	Variety	Mean yield per 1/120th acre in lbs.
S.K. 36 ...	25.0	S.K. 36 ...	25.3
S.K. 371 ...	21.9	S.K. 371 ...	27.5
S.K. 48 ...	26.8	S.K. 48 ...	28.6
S.K. 146 ...	21.3	S.K. 146 ...	26.6
Mean ...	23.7	Mean	27.0
S.D. 2.21 lbs. (9.3% of mean) M.S.D. 3.86 lbs.		S.D. 1.95 lbs. (7.2% of mean) M.S.D. 3.39 lbs.	

Squares A and B combined.		Square C.	
Variety	Mean yield per 1/120th acre in lbs.	Variety	Mean yield per 1/120th acre in lbs.
S.K. 36 ...	25.1	S.K. 36 ...	26.4
S.K. 371 ...	24.7	Mayang Sa Gumpal (local)	25.8
S.K. 48 ...	27.7	S.K. 48 ...	27.5
S.K. 146 ...	24.0	Machang (local)	30.8
Mean ...	25.4	Mean ...	27.6
S.D. 2.24 lbs. (8.8% of mean) M.S.D. 2.24 lbs.		S.D. 1.97 lbs. (7.1% of mean) M.S.D. 3.40 lbs.	

Square D. (duplicate of C.)		Squares C and D combined.	
Variety	Mean yield per 1/120th acre in lbs.	Variety	Mean yield per 1/120th acre in lbs.
S.K. 36 ...	27.4	S.K. 36 ...	26.8
Mayang Sa Gumpal (local)	26.1	Mayang Sa Gumpal (local)	25.9
S.K. 48 ...	30.5	S.K. 48 ...	29.0
Machang (local)	30.5	Machang (local)	30.6
Mean ...	28.6	Mean ...	28.1
S.D. 0.83 lbs. (2.9% of mean) M.S.D. 1.45 lbs.		S.D. 1.76 lbs. (6.3% of mean) M.S.D. 1.90 lbs.	

Bagan Serai Test Plot.

This Plot was established during the season under review. The crop was disappointing owing to damage caused by drought at flowering time early in December. Some damage from rats also occurred.

The varietal trials consisted of a duplicated five-way Latin Square of Seraup strains. Results of the trials are shown below in Table XIV.

Table XIV.

Variety.	Mean yield per plot of 1/120th acre in lbs.		
	Square A.	Square B.	Squares A & B combined.
S.K. 36 ...	20.8	23.2	22.0
S.K. 48 ...	20.8	23.0	21.9
S.K. 146 ...	23.5	23.4	23.5
S.K. 371 ...	22.6	23.6	21.3
S.B. 15 ...	21.7	23.1	22.6
Mean ...	21.9	23.3	22.6
S.D. ...	1.15 lbs.	—	1.15 lbs.
S.D. as percentage of mean ...	5.2	—	7.7
M.S.D. ...	1.46 lbs.	No significant differences.	

Briah Test Plot.

Apart from an attack of *Nymphula depunctalis* in the nurseries a highly successful season was experienced at this plot. Floods in September caused no permanent damage and there was sufficient water during the December drought. The varietal trial in the form of a duplicated Latin Square was designed to test the relative yields of four selected varieties against that of one local unselected variety (Alor Star). Table XV summarizes the results.

Table XV.

Variety.	Mean yield per 1/120th acre in lbs.		
	Square A.	Square B.	Squares A & B combined.
M.E. 203 ...	17.9	19.2	18.6
Alor Star (local unselected) ...	20.0	17.6	18.8
N. 66 ...	19.3	18.1	18.7
Sm. 76 ...	19.6	20.9	20.3
Sm. 29 ...	22.9	21.6	22.3
Mean ...	19.9	19.5	19.7
S.D. ...	2.58 lbs.	2.66 lbs.	2.51 lbs.
S.D. as percentage of mean ...	12.9	13.6	12.7
M.S.D. ...	3.76 lbs.	3.90 lbs.	2.36 lbs.

Selinsing Test Plot.

Serious insect damage in the nurseries at this plot necessitated supplies of seedlings being brought from Briah Test Plot. Later in the season stem-borers became prevalent; nevertheless the season was generally satisfactory and yields exceeded those of previous years. The trials consisted of a five-way Latin Square duplicated, for comparison of certain medium maturation strains, and a four-way Latin Square for long-term Seraup strains. The results are summarized in Table XVI.

Table XVI.

Variety.	Mean yield per 1/120th acre in lbs.		
	Square A.	Square B.	Squares A & B combined.
Sm. 29 ...	17.1	15.5	16.3
Sm. 76 ...	13.1	13.1	13.1
N. 10 ...	15.6	15.9	15.8
N. 66 ...	13.4	13.4	13.4
M.E. 203 ...	10.8	10.1	10.5
Mean ...	14.0	13.6	13.8
S.D. ...	1.10 lbs.	1.50 lbs.	1.28 lbs.
S.D. as percentage of mean ...	7.1	11.1	9.3
M.S.D. ...	1.61 lbs.	2.20 lbs.	1.21 lbs.

Square C.	
Variety.	Mean yield per 1/120th acre in lbs.
S.K. 36 ...	13.5
S.K. 371 ...	16.3
S.K. 48 ...	15.3
S.K. 146 ...	16.4
Mean ...	15.4
S.D. ...	1.18 lbs.
S.D. as percentage of mean ...	7.7
M.S.D. ...	2.06 lbs.

Bukit Gantang Test Plot.

Conditions in this plot were rather unsatisfactory during the season. Trouble with the dam necessitated preparation of the land under difficult conditions. Rat damage occurred towards the end of the season and was so serious in one Latin Square as to render the figures obtained valueless. Damage by insects occurred to a minor extent. Harvesting was protracted by uneven ripening but weather at this time was dry and no lodging took place.

The trials consisted of five four-way Latin Squares, the results of which are shown in Table XVII.

Table XVII.

Square A.		Square B.	
Variety	Mean yield per 1/120th acre in lbs.	Variety	Mean yield per 1/120th acre in lbs.
S.B. 15 ...	23.3	S.B. 15 ...	23.0
S.K. 36 ...	23.6	S.K. 36 ...	20.1
S.K. 48 ...	20.0	S.K. 48 ...	20.6
S.K. 68 ...	20.0	S.K. 68 ...	19.8
Mean ...	21.7	Mean ...	20.9
No significance.		No significance.	

Square E.	
Variety	Mean yield per 1/120th acre in lbs.
R.S. 17 ...	12.1
R.S. 18 ...	10.3
R.S. 24 ...	9.6
R.S. 34 ...	7.8
Mean	10.0
S.D. 0.84 lbs. (8.4% of mean) M.S.D. 1.46 lbs.	
Note.—It is probable that these strains have interacted significantly with some factor severely limiting yields, and it is probably unwise to extend deductions beyond the actual site of the experiment.	

Note :—Square C. Rat damage was too extensive for any reliance to be placed on results.
Square D. Results were so uneven that they obviously have no value.

Talang Experiment Station.

Selection.—Twelve pure-line strains with medium or short maturation periods, transferred from Titi Serong Experiment Station, were maintained under the more suitable conditions at Talang.

Hybridization.—Successful crosses were made between Nachin 10 and Nachin 27 with the object of obtaining a strain combining the yielding capacity of Nachin 10 with the straw-strength of Nachin 27.

Varietal Trials.—The varietal trials consisted of a duplicated five-way Latin Square and three four-way Latin Squares (including one duplicate). On the whole the crop was satisfactory although dry weather at flowering caused some damage.

Table XVIII summarizes the results of these varietal trials.

Table XVIII.

Variety.	Mean yield per 1/120th acre in lbs.		
	Square A.	Square B.	Squares A & B combined.
Sm. 29 ...	22.8	20.3	21.6
Sm. 76 ...	22.4	21.1	21.8
M.E. 203 ...	26.8	22.9	24.9
R. 2 ...	22.2	21.6	21.9
N. 756 ...	23.2	23.2	22.3
Mean ...	23.5	21.5	22.5
S.D. ...	2.33 lbs.	2.82 lbs.	1.92 lbs.
S.D. as percentage of mean ...	9.9	13.2	8.8
M.S.D. ...	2.52 lbs.	3.05 lbs.	1.86 lbs.

Variety.	Mean yield per 1/120th acre in lbs.		
	Square C.	Square D.	Squares C & D combined.
R. 2 ...	22.9	16.3	19.6
R. 16 ...	22.6	16.9	19.7
R. 13 ...	25.5	21.6	23.6
R. 1 ...	25.0	22.5	23.7
Mean	24.0	19.3	21.7
S.D. ...	3.85 lbs.	2.57 lbs.	3.44 lbs.
S.D. as percentage of mean ...	16	13.3	15.8
M.S.D. ...	nil	4.64 lbs.	3.77 lbs.

Square E.	
Variety.	Mean yield per 1/120th acre in lbs.
R.S. 17 ...	20.7
R.S. 18 ...	16.6
R.S. 24 ...	21.5
R.S. 34 ...	25.0
Mean ...	21.0
S. D. 2.51 lbs. (11.9% of mean.)	M. S. D. 4.36 lbs.

Lenggong Test Plot.

Serious damage was caused to the crop at this plot by flood water. Extensive lodging and shedding of grain together with damage from rats made the results from three of the four Latin Squares valueless. Summarized results of the fourth square are shown in Table XIX.

Table XIX.

Variety.	Mean yield per 1/120th acre in lbs.
M.E. 203 ...	27.8
M. E. 210 ...	31.4
Sm. 29 ...	25.6
Sm. 76 ...	21.6
Mean	26.5
S. D. 4.22 lbs. (15.9% of mean)	M. S. D. 7.34 lbs.

Bruas Test Plot.

The season at this plot was fairly satisfactory. Unevenness of the land caused an unduly high experimental error in two of the three Latin Squares laid down. There was a shortage of water at flowering time owing to the collapse of a dam and dry weather. The summarized results of the varietal trials are shown in Table XX.

Table XX.

Square A.		Square B.		Square C.	
Variety.	Mean yield per 1/120th acre in lbs.	Variety.	Mean yield per 1/120th acre in lbs.	Variety.	Mean yield per 1/120th acre in lbs.
S.K. 36 ...	21.0	R. 4 ...	24.1	Sm. 29 ...	21.9
S.K. 48 ...	16.8	R. 13 ...	24.5	Sm. 76 ...	17.0
S.B. 15 ...	21.1	R. 7 ...	22.3	N. 66 ...	22.0
S.K. 371 ...	21.3	R. 2 ...	11.0	M.E. 203	18.3
Mean	20.1	Mean	20.5	Mean	19.8
S.D.	4.82 lbs.	S.D.	3.69 lbs.	S.D.	0.97 lb.
S.D. as percentage of mean	23.9	S.D. as percentage of mean	18.0	S.D. as percentage of mean	4.9
M.S.D.	8.36 lbs.	M.S.D.	6.43 lbs.	M.S.D.	1.89 lbs.

Sungei Tontong Test Plot.

As in previous years, a most unsatisfactory season was experienced and no useful results were obtained. Neither irrigation nor adequate drainage facilities exist; the soil is peaty and damage from pests is severe.

Selangor.

Panchang Bedena Test Plot

The crop on this plot suffered severely from insect and rat damage. The yield trials consisted of three four-way Latin Squares, the results of which are summarized in Table XXI.

Table XXI.

Square A.		Square B.	
Variety.	Mean yield per 1/120th acre in kati *	Variety.	Mean yield per 1/120th acre in kati *
S.B. 15 ...	11.2	R. 2 ...	7.6
R. 13 ...	8.0	R. 4 ...	4.7
S.K. 48 ...	8.0	R. 11 ...	4.2
S.K. 36 ...	10.7	R. 13 ...	7.4
Mean	9.47	Mean	5.99
S.D. 1.7 kati (19.9% of mean) No significance.		S.D. 1.79 kati (29.8% of mean) No significance.	

* 1 kati = 1⅓ lbs.

Square C.	
Variety.	Mean yield per 1/120th acre in kati.
Sm. 29 ...	5.5
N. 66 ...	6.0
N. 756 ...	4.9
Sr. 824 ...	1.5
R. 13 ...	2.1
Mean	4.0

Note.—Eleven of the twenty-five plots in this square were completely destroyed by insects and rats. The results were therefore not worth analysis..

Sungei Haji Durani Test Plot.

The crop obtained at this plot was fairly satisfactory in spite of rather severe rat damage. The varietal trials consisted of four Latin Squares, the summarized results of which are shown in Table XXII.

Table XXII.

Square A.		Square B.	
Variety.	Mean yield per 1/120th acre in lbs.	Variety.	Mean yield per 1/120th acre in lbs.
S.B. 15 ...	3.83	R. 2 ...	8.0
R. 13 ...	6.75	R. 4 ...	11.6
S.K. 48 ...	5.25	R. 11 ...	10.75
S.K. 36 ...	8.46	R. 13 ...	7.9
Mean	6.08	Mean	9.56
S.D. 1.18 lbs. (19.4% of mean.)		S.D. 1.98 lbs. (20.7% of mean)	
M. S. D. 2.05 lbs.		M. S. D. 3.46 lbs.	

Square C.		Square D.	
Variety.	Mean yield per 1/120th acre in lbs.	Variety.	Mean yield per 1/120th acre in lbs.
Sm. 29 ...	26.6	M.E. 203 ...	4.8
N. 66 ...	20.0	M.E. 88 ...	6.2
N. 756 ...	25.5	R. 13 ...	7.0
Sr. 824 ...	21.5	Rey. 20 ...	10.0
R. 13 ...	13.2		
Mean	21.3	Mean	7.0
S.D. 4.3 lbs. (20.2% of mean.)		S.D. 3.3 lbs. (47% of mean.)	
M. S. D. 6.3 lbs.		M. S. D. 5.7 lbs.	

Tanjong Karang Test Plot.

Lack of water during the latter part of the growing season and severe rat-damage prevented reliable results being obtained from this plot.

Kuang Test Plot.

The crop here suffered so severely from rats, birds, insects and from unavoidable difficulties in water-control that no results of value were obtained.

Kajang Test Plot.

The varieties under trial were N 27, N 756, Acheh and Radin Siak. Of these the highest yielder was N 756 with the indifferent record of 292 gantangs per acre. Serious rat-damage together with water shortage resulted in a high experimental error and valueless results.

Negri Sembilan.

Kuala Klawang Test Plot (Jelebu)

Selection.—Selection of seventeen local varieties was undertaken. Two of these (Serendah Kuning and Serendah Puteh) were sent to Pulau Gadong (Malacca) for trial. The remaining fifteen were reserved for further selection.

Varietal Trials.—The unsuitability of the plot resulted in its abandonment at the end of the season in favour of a more suitable site. Three Latin Squares were laid down but planting took place too early for the short term varieties.

Excessively heavy bird damage occurred and no figures of value were obtained.

Kendong Test Plot.

Conditions in this plot were slightly less favourable than usual. Four Latin Squares were used in the varietal trials the results of which are summarized in Table XXIII. The highest yield was obtained from Milek Kuning 3 which gave a calculated crop of 1836 lbs. per acre.

Table XXIII.

Square A.		Square B.	
Variety.	Mean yield per 1/120th acre in lbs.	Variety.	Mean yield per 1/120th acre in lbs.
R.S. 18 ...	9.1	M.K. 3 ...	15.3
R.S. 17 ...	9.9	F.S. 11 ...	11.4
R.S. 7 ...	9.9	Serendah Kuning (local)	12.5
R.S. 24 ...	8.4	Sr. 875 ...	8.8
Mean	9.3	Mean	11.4
S.D. 0.9 lb. (9.7% of mean.) M.S.D. 1.6 lbs.		S.D. 1.26 lbs. (11.0% of mean.) M.S.D. 1.84 lbs.	

Square C.		Square D.	
Variety.	Mean yield per 1/120th acre in lbs.	Variety.	Mean yield per 1/120th acre in lbs.
R. 2 ...	10.5	S.K. 48 ...	11.6
N. 66 ...	13.6	R. 13 ...	10.6
Sm. 29 ...	14.5	S.K. 36 ...	10.6
Serendah Kuning (local)	14.0	S.B. 15 ...	13.2
Mean	13.2	Mean	11.5
S.D. 1.24 lbs. (9.4% of mean) M.S.D. 2.15 lbs.		S.D. 1.52 lbs. (13.2% of mean.) M.S.D. 2.62 lbs.	

Malacca.

Pulau Gadong Experiment Station.

Apart from certain portions of newly-opened land, a satisfactory season was experienced at this Station in spite of the somewhat adverse weather conditions.

Selection.—(a) Nachin. In order to confirm the results of the previous season in ear-to-row tests, a Latin Square of Nachin selections was planted. Results confirmed the belief that none of the more recent selections are superior to Nachin 66.

(b) Radin Siak. Work on this variety consisted of a Latin Square trial of four strains with the object of ascertaining the most satisfactory one for local conditions. Table XXIV shows the summarized result. No strain was significantly superior to the others.

Table XXIV.

Variety.	Mean yield per 1/120th acre in lbs.	Remarks.
R.S. 25 ...	21.8	S.D. 1.47 lbs. (6.4% of mean.)
R.S. 17 ...	22.8	M.S.D. 2.60 lbs.
R.S. 34 ...	23.2	
R.S. 24 ...	24.0	
Mean ...	22.9	

(c) Milek Puteh. Two Latin Square trials were laid down with the object of making final selections. Table XXV shows the results of this trial.

Table XXV.

Square A.		Square B.	
Variety.	Mean yield per 1/360th acre in kilos.	Variety.	Mean yield per 1/360th acre in kilos.
M.P. 7 ...	2.71	M.P. 7 ...	3.28
M.P. 8 ...	2.93	M.P. 18 ...	3.16
M.P. 9 ...	3.83	M.P. 12 ...	3.23
M.P. 148 ...	4.01	M.P. 14 ...	3.64
Mean ...	3.37	Mean ...	3.33
S.D. 0.258 kilos (7.6% of mean) M.S.D. 0.450 kilos.		No significance	

(d) Serendah. This was the first season of ear-to-row selections with this variety. One hundred and fifty rows were planted from one hundred and fifty single plant selections of the previous year. Twenty-nine selections were made for future observation.

(e) Varieties from Brunei. Four selected varieties were grown but results were unsatisfactory.

(f) Foreign varieties. Table XXVI shows imported varieties which were planted for trial during the season under review.

Table XXVI.

Variety.	Country of Origin.	Notes.
Oerang Oerangan	Java	Flowered 10 weeks after transplanting. Very poor in growth and yield.
Tong San	„	Flowered 5 weeks after transplanting. Very poor in growth and yield.
Kar Serong	Java	Flowered 9 weeks after transplanting. Very poor in growth and yield.
Sze Min	Hongkong	In ear 6 weeks after transplanting at height of 6 to 10 inches. Destroyed as they became a centre of insect attack.
Lam Shum Tsim	„	
Blue Stock	British Guiana	Growth poor. Flowered two months after transplanting, at height of 12 to 18 inches. Tillering was poor. A little grain was harvested.
Demerara Creole	„ „	
Ramacajara	„ „	
No. 75	„ „	
No. 79	„ „	

Varietal Trials.—Two varietal trials were laid down in the form of Latin Squares, results of which are shown below in Table XXVII.

Table XXVII.

Square A.		Square B.	
Variety.	Mean yield per 1/120th acre in lbs.	Variety.	Mean yield per 1/120th acre in lbs.
N. 66 ...	23.4	R.S. 69 ...	16.9
M.P. 3 ...	27.1	R.S. 34 ...	17.1
M.P. 9 ...	24.9	N. 27 ...	16.6
Sm. 29 ...	23.6	M.P. 11 ...	16.1
Mean ...	24.8	Mean ...	16.67
S.D. 1.4 lbs. (5.6% of mean.) M.S.D. 2.44 lbs.		Not analysed. No significant differences.	

Pahang.

Temerloh Test Plot.

Weather conditions were generally favourable throughout the season, but there was a slight delay in transplanting due to deep water.

The summarized results of the varietal trials at this plot are shown in Table XXVIII.

Table XXVIII.

Square A.		Square B.	
Variety.	Mean yield per 1/150th acre in kati.	Variety.	Mean yield per 1/150th acre in kati.
R. 2 ...	6.12	N. 66 ...	13.88
Sri Ayer ...	7.42	Sm. 76 ...	13.31
M.K. 2 ...	3.22	M.P. 4 ...	13.78
M.K. 3 ...	3.68	Sm. 29 ...	17.62
Mean ...	6.35	Mean ...	14.65
S.D. 2.2 kati (34.6% of mean.) M.S.D. 3.79 kati.		S.D. 1.32 kati (9% of mean.) M.S.D. 2.3 kati.	

Square C.		
Variety.	Mean yield per 1/150th acre in kati.	Remarks.
Sr. 875 ...	6.87	S.D. 1.26 kati (20.6% of mean.) M.S.D. 3.26 kati.
R.S. 84 ...	7.48	
N. 27 ...	6.65	
R.S. 24 ...	3.37	
Mean ...	6.1	

Dong Test Plot.

Growing conditions at this plot were satisfactory throughout the season, and good yields—giving a calculated mean for all strains of 2,586 pounds per acre—were obtained. The results of varietal trials which were carried out in five Latin Squares are summarized in Table XXIX.

Table XXIX.

Square A.		Square B.	
Variety.	Mean yield per 1/120th acre in kati.	Variety.	Mean yield per 1/120th acre in kati.
Sm. 29 ...	21.1	M.P. 11 ...	9.6
Sm. 76 ...	16.1	M.P. 7 ...	15.3
M.E. 210 ...	15.5	M.K. 2 ...	18.4
M.E. 203 ...	17.2	M.K. 3 ...	21.4
Mean ...	17.5	Mean ...	16.2
S.D. 2.4 kati (13.7% of mean.) M.S.D. 4.17 kati.		S.D. 1.82 kati (11.2% of mean.) M.S.D. 3.16 kati.	

Square C.		Square D.	
Variety.	Mean yield per 1/120th acre in kati.	Variety.	Mean yield per 1/120th acre in kati.
N. 66 ...	18.7	F.S. 12 ...	16.1
N. 11 ...	18.9	N. 27 ...	14.6
Rey. 20 ...	16.7	N. 756 ...	16.9
Gandar (local)	14.4	Sr. 875 ...	15.7
Mean ...	17.2	Mean ...	15.8
No significance		No significance	

Square E.		
Variety.	Mean yield per 1/120th acre in kati.	Remarks.
R.S. 17 ...	13.8	Manure having been applied to R.S. 24, the results were not analysed.
R.S. 18 ...	13.4	
R.S. 24 ...	16.4	
R.S. 34 ...	12.8	
Mean	14.1	

Kuala Lipis Test Plot.

This plot was utilized for the first time during the season. Being situated on an area of old well-worked land, and being favoured with good weather conditions the crop reaped was satisfactory.

The results of the six Latin Square varietal trials are shown in Table XXX.

Table XXX.

Square A.		Square B.	
Variety.	Mean yield per 1/120th acre in kati.	Variety.	Mean yield per 1/120th acre in kati.
S.K. 36 ...	11.1	Sm. 29 ...	14.3
T. Papan ...	7.9	Sm. 76 ...	9.1
R. 2 ...	10.1	M.E. 203 ...	10.9
R. 13 ...	14.9	M.E. 210 ...	12.9
Mean ...	11.0	Mean ...	11.8
S.D. 1.16 kati (10.5% of mean.) M.S.D. 2.02 kati.		S.D. 1.88 kati (15.9% of mean.) M.S.D. 2.75 kati.	

Square C.		Square D.	
Variety.	Mean yield per 1/120th acre in kati.	Variety.	Mean yield per 1/120th acre in kati.
M.K. 2 ...	17.1	N. 66 ...	11.4
M.K. 3 ...	21.0	N. 11 ...	8.5
M.P. 11 ...	9.0	Rey. 20 ...	16.0
M.P. 7 ...	12.9	Sri Menjadi (local)	12.4
Mean ...	15.0	Mean ...	12.2
S.D. 3.22 kati (21.4% of mean.) M.S.D. 5.6 kati.		S.D. 1.50 kati (12.3% of mean.) M.S.D. 2.6 kati.	

Square E.		Square F.	
Variety.	Mean yield per 1/120th acre in kati.	Variety.	Mean yield per 1/120th acre in kati.
Sr. 875 ...	10.0	R.S. 7 ...	13.9
N. 756 ...	12.9	R.S. 18 ...	13.0
F.S. 12 ...	13.3	R.S. 34 ...	11.9
N. 27 ...	10.6	R.S. 24 ...	14.4
Mean ...	11.7	Mean ...	13.3
S.D. 1.0 kati (8.5% of mean.) M.S.D. 1.74 kati.		Not analysed as manurial application was made to R.S. 24.	

Pekan Test Plot.

Weather conditions throughout the season were favourable. Varietal trials consisted of a comparison between eighteen pure strains and two local varieties tested in five four-way Latin Squares, the results of which are shown in Table XXXI. The mean calculated yield for all strains was 1,080 pounds per acre.

Table XXXI.

Square A.		Square B.	
Variety.	Mean yield per 1/120th acre in lbs.	Variety.	Mean yield per 1/120th acre in lbs.
N. 66 ...	12.9	M.K. 3 ...	12.5
R. 2 ...	7.5	M.K. 2 ...	13.0
R. 13 ...	8.5	M.P. 4 ...	9.1
Milek Puteh (local)	12.1	M.P. 7 ...	8.0
Mean ...	10.3	Mean	10.65
S.D. 1.58 lbs. (15.4% of mean.) M.S.D. 2.75 lbs.		Not analysed. Error should not be greater than in Square A.	

Square C.		Square D.	
Variety.	Mean yield per 1/120th acre in lbs.	Variety.	Mean yield per 1/120th acre in lbs.
M.E. 210 ...	7.8	Sri Ayer (local)	7.0
M.E. 203 ...	6.5	Sr. 875 ...	4.5
Sm. 29 ...	10.4	N. 27 ...	7.0
Sm. 76 ...	10.8	Sr. 824 ...	6.6
Mean ...	8.9	Mean ...	6.27
S.D. 0.66 lb. (7.4% of mean.) M.S.D. 1.15 lbs.		No significance (Z ratio 3.1 against 3.5 required)	

Square E.		
Variety.	Mean yield per 1/120th acre in lbs.	Remarks.
R.S. 24 ...	10.8	The variation between plots was too large for significance to be attained. Not analysed.
R.S. 18 ...	8.4	
R.S. 34 ...	7.9	
R.S.. 17 ...	8.8	
Mean ...	8.89	

Sungei Blat Test Plot.

Weather conditions during the season were not very favourable. Lack of water early in the season delayed preparation of the land and damaged the seedlings. The land is uneven and the growth of the crop was very irregular.

Varietal trials consisted of comparisons of nineteen pure strains and four local varieties in seven four-way Latin Squares. The results were too irregular to be of any value though the best yielders appeared to be Siam 29 and Nachin 66. The mean calculated yield per acre for all strains was 1,105 pounds.

Kelantan.

Central Experiment Station.

Varietal trials at this Station were laid out in five Latin Squares, the results of which are summarized in Table XXXII.

Table XXXII.

Square A. (Dry padi, long term)		Square B. (Wet padi, long term)	
Variety.	Mean yield per 1/120th acre in lbs.	Variety.	Mean yield per 1/120th acre in lbs.
Jintan Manis ...	14.3	R. 13 ...	25.3
Jintan Koreng	14.7	Sm. 29 ...	32.2
Padang Serai ...	12.7	N. 66 ...	27.8
Anak Lebah ...	12.7	Sm. 76 ...	25.5
Kaki Merpati ...	13.8	N. 27 ...	24.8
Sa Bumi Puteh	15.8	R. 2 ...	24.7
Mean ...	14.0	Mean ...	26.9
No analysis was made as yields from three plots were very abnormal and there would obviously be no significant differences in yield.		S.D. 1.9 lbs. (7.0% of mean.) M.S.D. 2.5 lbs.	

Square C. (Wet padi, long term)		Square D. (Wet padi, short term)	
Variety.	Mean yield per 1/120th acre in lbs.	Variety.	Mean yield per 1/120th acre in lbs.
S.B. 15 ...	26.7	Acheh ...	25.5
S.K. 36 ...	27.8	Jambu ...	20.8
S.K. 48 ...	24.3	R.S. 17 ...	24.0
R. 2 ...	26.7	R.S. 18 ...	23.0
R. 4 ...	24.5		
M.E. 203 ...	27.8		
Mean ...	26.3	Mean ...	23.8
S.D. 2.8 lbs. (10.6% of mean) M.S.D. 3.6 lbs.		S.D. 1.9 lbs. (8.1% of mean) M.S.D. 3.3 lbs.	

Square E. (Wet padi, short term.)		
Variety.	Mean yield per 1/120th acre in lbs.	Remarks.
Acheh ...	24.5	Figures from this plot were not analysed as they obviously show no significant differences.
Jambu ...	21.4	
R.S. 7 ...	22.8	
R.S. 24 ...	22.7	
Mean ...	26.3	

Pasir Puteh Test Plot.

Four varietal trials were laid down at this Station. The season was satisfactory and the trials gave results summarized in Table XXXIII.

Table XXXIII.

Square A.		Square B.	
Variety.	Mean yield per 1/120th acre in lbs.	Variety.	Mean yield per 1/120th acre in lbs.
Serendah ...	17.1	Chantek ...	16.6
Manik Siam ...	18.7	Anak Ulat ...	17.6
Nalong ...	18.6	Anak Ikan Tinggi ...	12.3
Padang Trengganu ...	19.1	Anak Naga ...	14.8
Siam ...	14.5	Sm. 29 ...	11.8
Mean ...	17.6	Mean ...	14.6
S.D. 1.47 lbs. (8.4% of mean) M.S.D. 2.15 lbs.		S.D. 1.97 lbs. (13.4% of mean) M.S.D. 2.87 lbs.	

Square C.		Square D.	
Variety.	Mean yield per 1/120th acre in lbs.	Variety.	Mean yield per 1/120th acre in lbs.
N. 756 ...	2.5	R. 4 ...	14.3
Sr. 824 ...	12.4	Sm. 76 ...	9.9
Sm. 29 ...	14.1	Sm. 29 ...	8.9
N. 66 ...	13.6	R. 13 ...	11.0
Mean ...	10.7	Mean ...	11.0
S.D. 1.43 lbs. (13.3% of mean) M.S.D. 2.48 lbs.		S.D. 1.17 lbs. (10.7% of mean) M.S.D. 2.04 lbs.	

Brunei.

Kilanas Test Plot.

The varietal trials at this plot consisted of five Latin Squares, two of which were rendered valueless by lack of crop from several of the plots. The results of the remaining three squares are shown in Table XXXIV.

Table XXXIV.

Square A.		Square B.	
Variety.	Mean yield per 1/120th acre in lbs.	Variety.	Mean yield per 1/120th acre in lbs.
S.K. 48 ...	16.2	R. 13 ...	10.6
S.K. 36 ...	16.5	R. 4 ...	11.66
S.B. 15 ...	17.7	R. 2 ...	12.6
Jongkok ...	18.7	Langsat ...	12.6
Mean ...	17.25	Mean ...	11.86
S.D. 1.15 lbs. (6.65% of mean) M.S.D. 2.0 lbs.		S.D. 1.28 lbs. (10.8% of mean) M.S.D. 2.2 lbs.	

Square C.		
Variety.	Mean yield per 1/120th acre in lbs.	Remarks.
M.E. 80 ...	19.3	S.D. 1.22 lbs. (6.3% of mean) M.S.D. 2.15 lbs.
Rey. 20 ...	21.2	
Rey. 6 ...	18.75	
M.E. 88 ...	18.75	
Mean ...	19.5	

Summary of the Present Position with regard to Yield Trials and Selection.

The main purpose of the yield trials and selection of padi at various stations throughout the country is to determine the particular variety or varieties most suited to the conditions peculiar to different localities. This is rendered necessary by the varying climatic and soil conditions and by differences in water control.

Yield trials of selected varieties of padi, (with modern lay-out and statistical analysis of results) have therefore been carried out for four or five seasons in all the more important padi-growing areas of the country, and the present position of our knowledge is briefly summarized below.

Krian.

In the northern section of this area where the land is soft and the water is generally rather deep, Seraup Kechil 48 has been found satisfactory. Three other strains of Seraup Kechil are still under trial and there appears to be little to choose between the four strains. About 700 acres of Seraup Kechil 48 have been planted on a Chinese estate, and a bonus offered by the local mill for this strain has resulted in the planting of a further 56 acres in one block by Malay small-holders.*

In the areas of Krian where intermediate conditions of land and water exist, the Radins have proved themselves the most useful. It is not yet certain which of the Radin strains will ultimately prove to be the best, and yield-trials are being continued in order to determine this point.

In the southern areas of Krian where the land is harder, and where water is comparatively shallow, the Malacca selection Siam 29 is generally satisfactory. Cultivators have been advised to plant this variety and seed has been distributed.

During the past season action has been taken to distribute seed of the best Seraup strains and of Siam 29 to local headmen and planters for demonstration purposes under normal field conditions. It is hoped that, in course of time, the largest possible area will be planted with pure strains of the two or three most suitable varieties in order that the local mills may obtain unmixed padi.

Kedah.

In Kedah the position has been reached where it is possible to recommend for general planting (according to local conditions) one of the following six varieties :—Chubai 18, Mayang Ebus 88, Radin Che Nah 28, Radin China 4, Radin China 17, and Reyong 20.

At the State Padi Show held in March, 1935, two local millers offered special prizes for samples of Reyong and Mayang Ebus and promised a bonus for large supplies of these strains.

Selection of other local and imported varieties is being continued in the hope of finding something even better than the present selections and of finding varieties suitable to particular local conditions.

Malacca.

In Malacca, milling is not yet of paramount importance, but the high yields and satisfactory eating qualities of Siam 29 and Nachin 66—and to a lesser extent of Nachin 11 and Siam 76—have caused an extensive demand for seed of these strains during the past three seasons. Although some 3,000 gantangs of seed have been distributed annually during the last five years the demand has consistently exceeded the avilable supply. There has also been a considerable demand for seed of these strains from the neighbouring State of Johore.

* See "Milling Tests of Pure Strain Padi in Perak," *Malayan Agricultural Journal* Vol. XXIV No. 1, January, 1936.

One or two of the best selections of the short-term Radin Siaks have proved useful for distribution in areas where earlier plantings of long-term varieties have suffered damage from floods.

Province Wellesley.

In Province Wellesley distribution of selected strains has not been extensive as there is still some uncertainty as to the most suitable for local conditions. In the Central and Northern Districts Siam 29 and Mayang Ebus 203 are suitable for most areas except those in which the land is soft and the water deep. In such localities the Seraups which are proving their worth in North Krian, will probably be the most satisfactory.

Other Localities.

In Penang, Central and Southern Perak, Selangor, Negri Sembilan, the greater part of Pahang, in Kelantan, and Brunei, the best strains for general cultivation have not yet been determined. Certain strains under trial are promising, as may be seen by reference to the tables in the earlier part of this article.

Yield trials of such selections are therefore being continued in all these localities where it is not yet certain which strains are best suited to local conditions.

At all stations throughout the country work will be continued to determine the most satisfactory strains for particular local conditions. Selections from local and imported varieties will also be continued with the object of obtaining further improvement in yield and other desirable qualities.

PADI MANURIAL AND MINOR CULTURAL TRIALS.

Compiled by
R. G. H. Wilshaw,
Chemist, Rice Research.

During the season 1933-34 a complex cultivation and green manuring experiment was laid down to test the effect of the addition of green matter combined with manuring and different forms of surface cultivation. The lay-out of this experiment and the season's results are described in the *Malayan Agricultural Journal,* Vol. XXII, No. 12, 1934, where it is shown that cultivation but not manures had significant effects. It was thought possible that the residual effects of these manures might be evidenced in the second season. The trials at Telok Chengai, Bukit Merah, Titi Serong, Briah and Pulau Gadong were, therefore, repeated this season without further treatment. This experiment is subsequently referred to as the standard cultivation and green manuring experiment.

In the statistical tables S.D. stands for standard deviation, M.S.D. for minimum significant difference, and I.C. for the increase over control plot necessary to attain significance.

Telok Chengai Station.

Standard Cultivation and Green Manuring Experiment—Residual Effects.—No significant results were obtained.

Leaf Pruning.—A simple line experiment was laid down to determine the effect on yield of leaf pruning at transplanting, this being a common practice among padi planters in Kedah. Results showed no significant difference.

Disposal of Straw.—A four-way Latin Square was laid down to determine the effects of (*a*) removing the straw with the stubble, (*b*) burning the straw and the stubble, (*c*) spreading the straw over the surface of the soil, (*d*) burning the straw and adding rock phosphate 16/29 at the rate of 250 lbs. per acre. Only treatment (*d*) showed significant increased yield, but the experiment will be repeated next season and continued for some years.

Table I.

Disposal of Straw Experiment—Telok Chengai.

Mean Yields of Padi in lbs. per 1/60th acre.

Treatment.	Yield.	
(*a*) Padi straw removed ...	63.25	S.D. 2.28 lbs. (3.5% of mean)
(*b*) „ „ burnt ...	62.87	M.S.D. 3.97 lbs.
(*c*) „ „ left to rot ...	65.12	
(*d*) „ „ burnt + rock phosphate	70.5	

Bukit Merah Test Plot.

Standard Cultivation and Green Manuring Experiment—Residual Effects.—No significant results were obtained.

Titi Serong.

Standard Cultivation and Green Manuring Experiment—Residual Effects.—No significant results.

Disposal of Straw.—An experiment was started to determine the effect of (*a*) straw burnt during the dry season, (*b*) straw burnt at *menajak**, (*c*) straw spread at harvest, (*d*) straw removed. It was not expected that any significant effects would be evidenced during the first season. The experiment will be continued.

Briah.

Standard Cultivation and Green Manuring Experiment—Residual Effects.—No significant results.

Chelupping.—A four-way Latin Square was laid down to determine the effect of chelupping† with Perlis phosphate, the seedlings being stacked for two nights prior to transplanting. The small increase in yield obtained by chelupping was not significant and would have proved uneconomic.

Selinsing.

Cultivation and Manuring Experiment.—This experiment differs from the standard cultivation and manurial experiment in being designed to test tajaking against changkolling¶ combined with artificial manuring. It was started in 1932-33 and in the first season showed increases due to phosphates over control only. Last season however it showed significant differences for changkolling over tajaking as well as for phosphates over control. (*Malayan Agricultural Journal* Vol. XXII p. 597). This season the changkolled plots again show superiority over the tajaked.

Chelupping.—A four-way Latin Square was laid down similar to that at Briah. In this instance a significant effect was obtained of economic worth.

Table II.

Cultivation and Manuring Experiment at Selinsing Station.
Mean Yields of Padi in lbs. per 1/80th acre.

Treatment.	Control.	P.	N.P.	Mean.
Changkol ...	28.1	29.4	29.0	28.9
Tajak ...	25.8	26.5	25.4	25.9
Mean ...	26.9	27.9	27.2	—
M.S.D. between changkol and tajak 2.4 lbs.				

* Period when "tajaking" (scything weed growth with a local tool called a *tajak*) is being carried out.

† Chelupping = dipping padi seedlings.

¶ Cultivation with a mattock or digging hoe, locally termed *chankol.*

Table III.

Chelupping Experiment at Selinsing.

Mean Yields of Padi per 1/120th acre in lbs.

Treatment.	Yield.
Chelup ...	19.8
Control ...	17.9
M.S.D. is 1.2 lbs.	

Lenggong.

Planting Distance Experiment.—This experiment was continued from last season but the figures obtained for yields were too variable to give any significant results on analysis.

Talang.

Standard Cultivation and Green Manuring Experiment—Residual Effects.—No significant results.

Kendong.

Green Manuring Experiment.—A four-way Latin Square of 1/160th acre plots was laid down with the following treatments.

(*a*) 140 lbs. green manure six weeks before planting.
(*b*) 140 lbs. green manure two weeks before planting.
(*c*) 140 lbs. green manure one week before planting.
(*d*) Control—no manure.

No significant results were obtained. (Table IV.)

Table IV.

Green Manurial Experiment, Kendong.

Mean Yields in lbs. per 1/160th acre.

Treatment.	Yield.	
G.M. 6 weeks before planting	9.6	S.D. 1.52 lbs. (15% of mean)
G.M. 2 weeks „ „	9.6	M.S.D. 2.61 lbs.
G.M. 1 week „ „	10.8	
Control—no manure	10.5	

Pulau Gadong.

Standard Cultivation and Green Manuring Experiment—Residual Effects.—No significant results were obtained.

Pekan.

Planting Distance Experiment.—A four-way Latin Square of 1/120th acre plots was laid down to compare planting distances of 9 inches, 12 inches, 15 inches and 18 inches. Owing to damage from pig and the variation in yield recorded no reliable deductions could be drawn.

Manuring Experiment.—A manurial experiment laid down to test nitrogen and phosphorus mixtures was destroyed by pig and water.

Sungei Blat.

Cultivation Experiment.—A four-way Latin Square was laid down to test various depths of changkolling and puddling with buffaloes. The results obtained were too irregular to be of any value.

Central Station, Kelantan.

At the Central Station, Kelantan, two manurial experiments were laid down, one with artificials and one with organic manures. These gave results as indicated in Table V.

In addition to these manurial squares three small experiments were laid down in connexion with optimum spacing, rate of application of bat guano, and optimum P/N ratio. None of these experiments gave results justifying analysis.

Pasir Puteh.

Two manurial experiments were laid down at this Station. Green manure, bat guano and control plots, and an experiment on the optimum rate of application of bat guano. This latter gave no results justifying analysis, but the former showed significant results as summarized in Table VI.

Summary.

The manurial trials laid down during 1934-35 were few compared with those during 1933-34 or earlier seasons.

As in previous years it has proved impossible to surmount the "bar", *vide Malayan Agricultural Journal* Vol. XXII, p. 583, December, 1934, by application of economic dressings, although as before, statistical significant results have followed the application of manures including phosphorus as a component. These increases are in general too small to be of practical value. On one of the trials at the Central Station, Kelantan, however, and at Pasir Puteh, profitable results were obtained by the use of the local guano, green manure, and cow dung.

In regard to other experiments, the standard cultivation and green manuring clearly has no residual effect, whilst experiments in connection with the disposal of straw at Telok Chengai and Titi Serong are being followed up as they are unlikely to give any information until they have been in progress for some seasons.

Table V.

Manurial Experiments at Central Station, Kelantan.

Square I. Treatment.	Mean Yield per 1/40th acre in lbs.	Square II. Treatment.	Mean Yield per 1/40th acre in lbs.
1. Cyanamide 1½ cwts. Basic slag 2 cwts. Sulphate of potash 1 cwt.	59.8	Green manure 5 tons Bat guano 3 cwts.	70.8
2. Superphosphate 2 cwts.	60.5	Green manure 5 tons Bat guano 3 cwts. Sulphate of potash 1 cwt.	68.5
3. Superphosphate 2 cwts. Sulphate of ammonia 1½ cwts.	67.2	Bat guano 3 cwts. Sulphate of potash 1 cwt.	60.2
4. Superphosphate 2 cwts. Sulphate of ammonia ½ cwt. followed one month later by an additional 1 cwt.	72.0	Cow dung 5 tons	74.2
5. Basic slag 2 cwts. Cyanamide 1½ cwts.	64.2	*Baja bakar* *	66.8
6. Control—no manure	58.2	Control—no manure	59.0
Mean	63.9	Mean	66.6
S.D. 7.5 lbs. (117% of mean) M.S.D. = 9.7 lbs. I.C. = 8.6 lbs.		S.D. 5.9 lbs. (8.8% of mean) M.S.D. = 7.6 lbs. I.C. = 6.7 lbs.	

* A mixture of burnt soil, burnt cow dung and ashes of coconuts and areca leaves in general use in Kelantan under the name *baja bakar*.

Table VI.

Manurial Experiment at Pasir Puteh.

Treatment.	Mean Yield per lb. per 1/40th acre.	
Green manure (5 tons per acre) ...	43.0	S.D. 4.3 lbs. (10.5% of mean)
Bat guano (4 cwts. per acre) ...	48.2	M.S.D. = 5.5 lbs.
Control—no manure ...	31.8	I.C. = 4.9 lbs.

CONDITIONS ON RUBBER SMALL HOLDINGS IN MALAYA.

4th Quarter, 1935.

Prepared by the Economic Branch of the Department of Agriculture, Straits Settlements and Federated Malay States, in collaboration with the Field Branch of the Department.

Rainfall.

The quarter was a very wet one, heavy rains being experienced in all parts of the Peninsula, with consequent flooding in certain districts. The rainfall was lighter and more intermittent during December.

Prices.

Prices remained steady during the quarter, but shewed a slight improvement at the close. Tables I and II shew prices paid for small-holders' rubber at several centres in each State, the mean of the highest and lowest prices being given in Table II.

Production.

Production of rubber on small holdings during 1935 is summarized in Table III, and the previous year's figures are included for the purpose of comparison. This table is compiled from the monthly report of stocks, imports and exports of rubber published by the Registrar-General of Statistics, Straits Settlements and Federated Malay States.

Tapping.

The results of the quarterly survey of small holdings out of tapping are summarized in Table IV. Estimates are obtained by counting the number of such holdings, and applying the percentage to the total area of small holdings in the District.

It will be seen that the estimated acreage out of tapping increased very considerably during the last quarter of 1935. The comparative figures for the Federated Malay States are: September 145,200 acres (27.2 per cent.), December 203,900 acres (38 per cent.). For the Straits Settlements the relative figures are: September 24,000 acres (20.6 per cent.), December 33,100 acres (28.4 per cent.).

The increase in holdings out of tapping is even more noticeable when the above figures are compared with those obtained at the end of 1934 which were: Federated Malay States 41,000 acres, and Straits Settlements 11,600 acres.

The system of estimating the area out of tapping on small holdings has been extended to the States of Johore and Kedah. At the present time insufficient data is available of the total area of small holding rubber in each

Table I.

Lowest and Highest Rubber Prices Paid by Local Rubber Dealers.

(In Straits dollars per picul (133 1/3 lbs.))

4th Quarter 1935.

	Penang	Perak	Selangor	Negri Sembilan	Pahang	Malacca	Kedah
			OCTOBER				
Smoked sheet	22.75-27.00	21.00-27.00	22.00-28.30	22.00-27.50	21.30-27.60	25.00-28.00	23.00-27.50
Unsmoked sheet	21.50-26.80	19.50-26.00	18.00-25.00	20.00-26.50	20.00-25.00	23.00-27.00	22.50-26.10
Scrap	15.00-18.00	—	18.00-20.00	17.00-21.00	—	17.00-21.50	17.00-25.00
			NOVEMBER				
Smoked sheet	26.50-29.00	24.00-27.80	24.00-27.50	25.00-27.50	23.00-28.00	24.00-27.50	26.50-27.50
Unsmoked sheet	25.00-27.00	23.00-26.50	18.00-25.50	23.00-26.50	22.00-26.00	23.50-26.50	25.00-26.50
Scrap	16.50-21.50	19.00-20.00	20.00-22.00	8.00-23.00	—	17.00-22.00	20.00-21.25
			DECEMBER				
Smoked sheet	26.25-28.50	24.50-27.75	23.00-27.50	24.00-27.50	24.00-27.50	25.00-28.50	27.00-28.00
Unsmoked sheet	25.00-27.60	21.00-26.55	20.00-26.00	20.00-26.50	23.00-26.00	23.75-27.00	25.00-27.00
Scrap	18.00-22.00	—	20.00-23.00	18.00-25.50	—	18.50-23.00	19.80-22.00

Table II.

Mean of Lowest and Highest Rubber Prices Paid by Local Dealers at a number of Centres in each State.

(In Straits dollars per picul (133 1/3 lbs.))

4th Quarter 1935.

	Penang	Perak	Selangor	Negri Sembilan	Pahang	Malacca	Kedah
			OCTOBER				
Smoked sheet	24.06-25.62	23.52-25.63	24.33-26.97	23.08-26.50	22.23-26.24	25.33-27.33	25.33-26.17
Unsmoked sheet	22.50-24.70	21.28-24.53	21.50-23.25	21.33-25.00	21.48-24.32	23.67-25.33	24.48-25.87
Scrap	15.94-17.12	—	18.00-19.00	17.50-19.50	—	17.50-19.50	18.67-20.83
			NOVEMBER				
Smoked sheet	26.75-28.00	25.55-26.86	25.28-26.80	25.60-27.20	24.17-26.73	25.17-27.08	27.00-27.16
Unsmoked sheet	25.50-26.75	23.92-25.22	22.25-23.95	24.42-25.75	23.75-25.15	23.83-25.67	25.33-26.00
Scrap	17.44-19.25	19.00-20.00	20.50-21.50	17.70-19.00	—	18.33-20.50	20.33-21.08
			DECEMBER				
Smoked sheet	26.69-28.00	26.02-27.04	25.33-27.17	25.20-26.78	24.97-26.68	26.17-27.53	27.00-27.75
Unsmoked sheet	25.25-27.00	24.13-25.27	23.00-24.73	23.67-25.92	24.00-25.25	24.25-26.23	25.50-26.53
Scrap	19.06-20.94	—	21.50-23.00	21.40-22.60	—	20.00-21.50	20.43-20.93

Table III.

Production of Rubber on Small Holdings.
(in tons)

	Total Year 1934	1st Quarter 1935	2nd Quarter 1935	3rd Quarter 1935	4th Quarter 1935	Total Year 1935
Federated Malay States ...	104,141	16,736	17,374	19,255	14,015	67,380
Unfederated Malay States ...	81,495	16,021	13,593	13,260	11,987	54,861
Straits Settlements ...	31,403	2,867	3,432	3,911	3,018	13,258
Total ...	217,003	35 624	34,399	36,456	29,020	135,499

District to render this estimate of out-of-tapping as close as is possible for the Federated Malay States and the Straits Settlements. The area of small holdings out of tapping in Johore at the beginning of January 1936 was estimated to be 137,400 acres or 35 per cent., and in Kedah 38,300 acres (38 per cent.)

Ignoring Perlis, Kelantan and Trengganu, in which States the area of rubber small holdings is relatively small, the total area of rubber on small holdings out of tapping at the end of the year 1935 was about 412,700 acres, or 34 per cent.

There are several contributory causes for the large increase referred to above. In the first instance, December 1934 was exceptional for the almost complete drought then experienced, whereas in December 1935 the rainfall was extremely heavy, rendering tapping impossible over large areas. The usual end of the quarter shortage of coupons was noted in all reports, the shortage being more in evidence in view of the lower export quota as compared with the previous year. In many districts the completion of padi planting and the incidence of padi harvesting have resulted in rubber holdings being neglected. Undoubtedly, however, the principal reason for the reduction in tapping is the high price which can be obtained for coupons without rubber. All reports draw attention to the large trade carried on in coupons, the price for which rose to $21 per picul equivalent. The difference in price for rubber is not sufficient to meet production costs if labour is employed, and often owners themselves can find more profitable employment.

Condition of Holdings.

The relatively high prices prevailing, coupled with the pressure exercised by the officers administering the coupon issue, have resulted in the maintenance of a fairly high level of sanitation. The report from Selangor points out

Table IV.

Estimated Acreage of Tappable Rubber which was out of Tapping on Holdings of less than 100 Acres, at the end of December, 1935.

PERAK				SELANGOR				NEGRI SEMBILAN				PAHANG			
District	Total Tappable area	Total area untapped	Percentage	District	Total Tappable area	Total area untapped	Percentage	District	Total Tappable area	Total area untapped	Percentage	District	Total Tappable area	Total area untapped	Percentage
Batang Padang	37,288	8,900	24	Klang	18,879	5,500	29	Seremban	19,241	16,700	87	Raub	7,361	1,000	13
Kinta	34,180	4,800	14	Kuala Langat	29,263	8,500	29	Tampin	17,947	11,700	65	Kuala Lipis	15,951	15,900	100
Kuala Kangsar	43,485	17,800	41	Ulu Langat	38,867	14,000	36	Kuala Pilah	17,470	5,400	31	Bentong	13,600	2,900	21
Upper Perak	13,774	2,900	21	Ulu Selangor	30,632	5,400	21	Jelebu	6,270	3,300	52	Other Districts†	31,223	24,400	78
Larut & Selama	51,407	4,100	8	Kuala Lumpur†	21,174	5,100	29	Port Dickson	10,653	8,700	82				
Krian	9,751	6,700	69	Kuala Selangor†	9,379	2,700	29								
Lower Perak*	47,937	19,700	41												
Dindings	7,279	5,800	80												
	245,101	70,700	29		148,194	43,200	29		71,581	45,800	64		68,135	44,200	65

MALACCA				PENANG & P. WELLESLEY				SINGAPORE			
District	Total Tappable area	Total area untapped	Percentage	District	Total Tappable area	Total area untapped	Percentage	District	Total Tappable area	Total area untapped	Percentage
Central	17,687	4,800	27	North	3,241	400	12	Singapore	12,781	1,200	9
Alor Gajah	31,387	12,600	40	Central	7,067	2,000	28				
Jasin	24,971	5,200	21	South	8,149	5,500	67				
				Penang	11,114	1,400	13				
	74,045	22,600	30		29,571	9,300	31		12,781	1,200	9

The percentage of areas out of tapping in September, 1935, was as follows:—Perak 26, Selangor 29, Negri Sembilan 51, Pahang 12, Malacca 25, Penang and Province Wellesley 15, Singapore 10.

* Estimated from percentage for Kuala Kangsar.

†Estimated from percentage for other Districts in the State.

that these influences may lead to an undesirable degree of clean weeding on sloping land, while it is stated that in one district of the same State, small holdings are extremely dirty.

Diseases.

Mouldy Rot was prevalent throughout the quarter due to the very wet weather conditions. In Selangor its incidence was less severe than is usual for the quarter, and this fact is attributed to the marked decrease in tapping noted in the State.

Several cases of Pink Disease were reported from the Lipis District of Pahang, and in some areas considerable damage was done to young trees,

Grades of Rubber.

In some parts of the Peninsula there has been a tendency towards the selling of more unsmoked sheet, and in one report it was suggested that this was due to the desire of many small-holders to realize cash as quickly as possible in view of the Hari Raya festivities.

Another report states that it is noticeable that numerous small holdings are now producing unsmoked sheet where formerly smoked sheet was preferred, the reason given being that the difference in price offered by dealers is insufficient to cover the extra cost of production.

Kedah.—Smoked sheet continued to be the most popular form in which sales were made, but in South Kedah there was a slight increase in the production of unsmoked sheet. The percentages of smoked and unsmoked sheet respectively were :— North Kedah 89, 6; Central Kedah 58, 40; South Kedah 46, 31 (scrap 23).

Perak.—There still continues a preference for unsmoked sheet in most parts of Perak as is shewn by the following percentages : (smoked sheet is quoted first) :— Perak North 27, 73; Krian 41, 59; Selama 80, 20; Perak South 32, 68.

Selangor.—Preference is still shewn for smoked sheet, the percentage in the Klang District being 90, and 10 per cent. scrap. In the Kuala Lumpur District the percentages were smoked 43, unsmoked 57.

Penang and Province Wellesley.—As shewn in previous reports, there is a marked preference for unsmoked sheet. Average percentages for the quarter were : smoked 10, unsmoked 86, scrap 4.

Malacca.—Percentages were as follows : Central, smoked 80, unsmoked 10, scrap 10; Jasin, smoked 49.6, unsmoked 48.4, scrap 2; Alor Gajah, smoked nil, unsmoked 98.6, scrap 1.4.

Negri Sembilan.—The majority of small-holders' rubber was disposed of as unsmoked sheet. The average percentages of sales at twenty centres were : smoked 37, unsmoked 62, scrap 1.

General.

Considerable interest continues to be shewn by small-holders in the smoking cabinets demonstrated by the Asiatic Rubber Instructors, and in some cases where these cabinets have been installed an excellent quality of smoked sheet has been produced.

The Instructors have continued their demonstrations and lectures on the correct maintenance of small holdings, disease control, tapping systems, and preparation of good quality sheet, and reports indicate that, in consequence, the general standard of small holdings and of small-holders' rubber is steadily improving. In this connexion it is anticipated that the reduction in tapping at the end of the quarter will have a beneficial effect by providing a resting period which will aid bark renewal.

OIDIUM HEVEAE LEAF DISEASE, 1936*

The Director will be obliged if proprietors or managers of estates will report early any suspected cases of *Oidium* Leaf Disease in 1936. In view of the fact that in 1935 a considerable amount of leaf-fall attributed to *Oidium Heveae* was in reality due to the microscopic insect Thrips, managers of estates where leaf disease is present are requested to send to the Institute a spray of foliage for diagnosis and confirmation.

Leaves picked from the ground are not suitable specimens for diagnosis. The specimen should consist of a spray of diseased young leaves and flowers picked direct from the tree and packed loosely and dry in strong paper. Posting at a time when the specimens are likely to lie in the post over a week-end should be avoided.

Oidium Heveae usually attacks only the newly-formed young leaves during refoliation after wintering and not the fully-mature leaves which fall during the wintering period.

A description of the disease has been published in the Institute's *Journal* (Vol. 2, No. 1, March 1930). Other articles on the disease and on treatment by sulphur dusting are published in subsequent numbers of the *Journal.*

Any manager who proposes to carry out sulphur dusting treatment either as a preventative or for the treatment of the disease is asked to notify the Director.

Attention is drawn to the fact that the disease is notifiable under the Agricultural Pests Ordinance (S.S.). and Agricultural Pests Enactment in each of the Federated Malay States, and in Johore and Kedah.

* The following Leaflet was published by the Director, Rubber Research Institute of Malaya in December 1935, and is reprinted in this Journal by request of the Director.

Abstract.

THE EXPORT CROPS OF THE NETHERLANDS INDIES IN 1934.

Bulletin No. 130 of the Central Bureau of Statistics of the Netherlands Indies.

This Report is especially interesting as a study of the effect of the universal trade depression on the economic situation in general, and in particular, of the reaction of the native population to these conditions.

As was to be expected, the production of foodstuffs for local consumption increased at the expense of the cultivation of export crops; the partial recovery of the export trade is evident, however, from the fact that the average value per metric ton of all agricultural products in 1934 was Gs. 104, as compared with Gs. 95 in 1933. The actual exports of such products amounted to 3,134,000 tons*, valued at 326 million guilders, as compared with 3,225,000 tons, valued at 306 million guilders in the previous year.

Of the total value of the 1934 exports of agricultural products, 64.7 per cent. was estate produce and 35.3 per cent. native grown.

Of the world exports of the important agricultural products, the percentage share of the Netherlands Indies in 1934 was: cinchona 90, pepper 80, kapok 79, rubber 37, coconuts 24, agave 23, tea 16, oil palm products 15.

Cane Sugar.

An area of 5,868 hectares† was planted with pedigree cane to serve as planting material. So great, however, was the decrease in the area planted that the crop from 4,181 hectares of this area had to be milled. In normal years, more than 11,000 hectares of nurseries are required. The total planted area was 34,211 hectares, as compared with 84,343 hectares in 1933 and 200,831 hectares in the peak year 1931. Native cultivation was not affected, the area planted remaining fairly stationary at 10,783 hectares.

The production of cane sugar was 636,104 tons, and exports were 1,089,248 tons.

Rubber.

The estate planted area is 601,286 hectares, of which 497,709 hectares are in bearing. Of the total, 144,618 hectares (or 24 per cent.) are budded rubber, fully half of which was planted in 1928 to 1930. The area of native holdings is unknown. Estate production was 192,830 tons, and total exports (including native rubber estimated on dry weight) were 385,492 tons, as compared with 286,818 tons in 1933.

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* Throughout this abstract, "ton" refers to the metric ton of 2,200 lbs.
† 1 hectare = 2.472 acres.

Of the estate area planted with rubber, 232,950 hectares are in Java, 348,940 hectares in Sumatra and 19,396 hectares in other islands.

The dry percentage of native rubber has greatly improved. The output of remilled native rubber in Netherlands Indies factories was 23,327,441 kilograms, as compared with 10,104,526 kilograms in 1933. Nearly 80 per cent. of the 1934 output came from Borneo.

Under the International Rubber Regulation Scheme the basic export quota for 1934 of the Netherlands Indies was 357,632 tons, of which 149,100 were allocated to native growers.

Coffee.

The planted area, as far as it is known, was 123,128 hectares on estates, and 22,986 hectares on native plantations in Java. This shews a slight increase over 1933. The production was 113,036 tons, of which 64,277 tons were from estates and 48,759 tons from native plantations in the Outer Provinces. The bulk of the production is Robusta coffee.

Tea.

The planted area on estates was 138,018 hectares (104,228 hectares in Java and 33,790 hectares in Sumatra), an increase of 174 hectares over 1933. The native area was 55,080 hectares, an increase over the previous year of 8,582 hectares. The area on estates in bearing was 131,396 hectares. The total quantity of made leaf on estates, including native leaf bought by estates and factories, was 71,293 tons, as compared with 75,292 tons in 1933, and 81,937 tons in 1932. The Netherlands Indies are included in the tea restriction scheme which came into force on 1st April 1933.

Tobacco.

The particular features of this trade in the Netherlands Indies have already been discussed in this Journal*. Cultivation of superior grades of leaf for cigar wrappers is limited to estate production on the East Coast of Sumatra. In 1934 this amounted to 12,862 tons, as compared with 13,069 tons in 1933, and 19,037 tons in 1930.

Estate cultivation of cheaper grades and European-managed curing of purchased native-grown leaf amounted to 18,916 tons in 1934. In addition, there is a large native output for local consumption as well as for export. It is estimated that the exports from this source in 1934 were 21,728 tons. There is also a small export trade in native cut-tobacco; exports of this grade in 1934 were 214 tons.

Cinchona.

The total area under this crop in 1934 was 18,336 hectares, 87 per cent. of which was in Java; total production amounted to 8,161 tons of dry bark. Restriction came into force on 1st March 1934.

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* *Malayan Agricultural Journal*, Vol. XXII No. 2, February, 1934.

Oil Palms.

The growth of this industry in recent years may be seen in the following table relating to the Netherlands Indies.

Table I.

Oil Palms: Areas and Production.

Year	Estates	Planted area. Hectares				Production. Kgs.		Export. Kgs.	
		Java	Outer Prov.	Total	In bearing	Kernels	Oil	Kernels	Palm Oil and Kernel Oil
1930	48	707	60,522	61,229	30,017	9,820,548	49,751,695	9,639,066	48,014,596
1931	51	705	67,725	68,430	36,322	12,805,305	64,457,238	12,200,201	61,387,360
1932	50	710	69,365	70,075	43,833	18,413,577	90,072,649	17,884,341	84,973,111
1933	50	762	71,319	72,081	50,319	22,804,790	112,153,520	23,100,106	116,263,614
1934	50	736	73,093	73,829	55,740	24,878,483	130,646,781	25,068,446	121,261,680

Cultivation is still expanding, especially on the East Coast of Sumatra. Of the total area, 92.8 per cent. is in northern Sumatra, 6 per cent. in southern Sumatra, 1 per cent. in Java and 0.2 per cent. elsewhere. Of the total planted area, 75 per cent. is in bearing.

The Netherlands Indies contribution to world exports has, in the course of the period 1925 to 1934, risen—for kernels from 0.3 per cent. to 4.1 per cent., and for palm oil from 3.5 per cent. to 36 per cent.

Coconuts.

The estate area in bearing is: Java 5.644 hectares, Outer Provinces 34,597 hectares, total production from these sources in 1934 being 28,685 tons. Java never has more than a small surplus available for export after satisfying local demand, the bulk of the exports coming from the Outer Provinces. In 1934 Java actually had to import coconuts from the Outer Provinces for domestic consumption. Native production of copra in Java and Madura for consumption in the local mills is estimated to have been 176,600 tons in 1934. In addition, the net imports in terms of copra for the same purpose, from the Outer Provinces are estimated at 19,663 tons. These figures take no account of the production for culinary purposes, and that used by the small native oil mills.

The export surplus from the Outer Provinces, however, in 1934 was the equivalent of 453,383 tons of copra, only 23,765 tons of which were produced on estates.

The total exports of copra, oil and nuts, converted to copra equivalent* were 421,815 tons in 1934, as compared with 503,827 tons in the previous year.

Essential Oils.

The only cultivated essential oil crop of any importance was citronella grass. The total planted area was 26,913 hectares, of which 8,700 hectares were estates (mostly in Java). The exports of the oil shew a steady increase for the past few years; in 1934, 1,790,007 kilograms were exported, as compared with 1,528,870 kilograms in 1933 and 817,563 kilograms in 1930.

Exports of other essential oils in 1934 were (in kilograms): cajaput oil 64,871, ylang-ylang oil 15,687, vetiver oil 5,817, patchouli 3,041, lemon grass oil 125, palma rosa 55.

Hard-rope Fibres.

These crops, chiefly sisal, are still entirely estate production. The exports in 1934 were 69,672 tons as compared with 94,898 tons in 1933.

Kapok.

Only *Ceiba pendantra* L. Gaertn. is cultivated. It is chiefly a native-grown crop and the cleaning of the fibre from the pods is largely a village industry. The bulk of the exports of fibre and seeds, and the entire export of oil and oil cakes comes from Java. The 1934 exports were as follows:—

Fibre	Seeds	Oil	Oil Cake
21,030	26,088	2,757	10,490 metric tons.

Cocoa.

The area under cultivation is very slowly but steadily increasing. The 1934 exports were 2,093 tons, estate production being 1,600 tons. Practically the entire export of estate produce comes from Java. The quality of the product is stated to be good.

Pepper.

Cultivation is almost entirely in the hands of native and Chinese growers in Sumatra and Borneo. The 1934 exports were (in metric tons):—

	Black	White	Total
Sumatra and adjacent islands ...	25,878	16,332	42,210
Borneo ...	672	5,683	6,355
Total ...	26,550	22,015	48,565

* Basis of conversion: 4300 nuts = 1 metric ton of copra and 1000 litres of oil = 220 gallons = 1.5057 metric tons of copra.
100 kilos. of oil = 1.673 metric tons of copra.

The total exports in 1934 were 48,182 tons, as compared with 44,014 tons in 1933, 35,585 tons in 1932, and 31,756 tons in 1931.

Tapioca.

Tapioca is grown chiefly in Java as a native crop for local consumption, and a comparatively small part of the total production is exported. The native area planted in 1934 was 764,000 hectares, as compared with 701,000 hectares in 1933 and 650,000 hectares in 1930.

The exports of tapioca products in 1934 were (in metric tons): dried tubers 25,353, dried and ground 6,975, flour 92,972, flakes and siftings 5,990, pearl and seed 13,484, fibre residue 623. In 1934 about 75 per cent. of the exports of dried tubers went to Spain in consequence of a special reduction in the rate of freight to Barcelona.

Coca.

This is exclusively an estate crop and is exported as leaf. Production has steadily declined for some years past. In 1934 it amounted to 104,307 kilograms, as compared with 485,407 kilograms in 1929.

Gambier.

Gambier cultivation is almost entirely confined to Sumatra, Rhio and Western Borneo. Native production is about three times greater than estate production, but the bulk of the former is consumed within the Netherlands Indies, whereas about two-thirds of the foreign exports are estate produce. In 1934 the producing areas exported 5,954 tons to foreign countries, 6,160 tons to Java and 116 tons to the Outer Provinces.

Arecanut.

This is an entirely native crop. The total exports in 1934 were 42,840 tons.

Nutmegs.

No figures can be given for native-grown produce or for local consumption. The exports in 1934 were: shelled nuts (gross weight) 1,951 tons, unshelled nuts (gross weight) 2,078 tons, mace (net weight) 618 tons. The chief producing area is the Banda Islands group; further supplies come from the Moluccas, Celebes and mid-Java.

Cloves.

The greater part of the supplies are from Benkoelen in Sumatra, and the Moluccas. The export to foreign countries is small, as Java not only consumes the bulk of the production, but in 1934 imported 5,000 tons from foreign countries. The cultivation of this crop in Achin is rapidly increasing.

Rice.

The 1934 Java crop was 3,542,988 tons of husked rice, all of which was consumed in the country of production.

The net imports of rice into the Outer Provinces in 1934 were 243,577 tons.

Maize.

Maize is exclusively a native crop for domestic consumption. The 1934 production of Java and Madura was estimated at 1,719,700 tons, of which only 31,377 tons were exported. The Outer Provinces exported 11,526 tons to foreign countries; this is less than one-fifth of the 1933 exports..

Groundnuts.

The 1934 exports to foreign countries were 30,106 tons. Of this total, Java exported 27,839 tons, although the Java production was estimated at 149,400 tons.

Sago.

In the eastern parts of the Archipelago sago is consumed locally; the chief exporters are the East Coast of Sumatra and Rhio. The 1934 exports to foreign countries were 31,040 tons.

Potatoes.

Exports are decreasing; in 1934 they totalled 2,019 tons, as compared with 4,954 tons in 1932 and 6,321 tons in 1930.

Derris.

The exported derris is mainly a forest product from Sumatra. Cultivation has started, but no figures are available in respect of areas. Exports in 1934 were 136 tons as compared with 20 tons only in 1933.

Miscellaneous Crops.

Amongst a number of crops of minor importance may be mentioned chillies, the exports of which were 1,762 tons, onions, 1,736 tons, cotton 1,050 tons.

L. A. J. R.
D. H. G.

Departmental.

FROM THE DISTRICTS.

Compiled by the Chief Field Officer from Monthly Reports submitted by Field Officers.

January, 1936.

The Weather.

The characteristic fairly cool, cloudy and generally wet weather attending the North-East Monsoon continued almost throughout the month, though towards its close there were signs that the usual shorter dry season was about to commence. In the northern half of the Peninsula the rainfall was well above average, but in the southern half it was little, if at all, above normal. On the west coast from Sitiawan southward precipitation was on the whole below the average, while on the east coast there was considerable variation in different localities. In Kelantan a heavy storm lasting two days accounted for 17½ inches out of a total of about 23 inches of rain. In Kuantan District, Pahang, the weather was comparatively dry, but from Pekan southward the rainfall was above average.

Remarks on Crops.

Padi.—In Kedah the padi harvest was in full progress, except around Baling. Weather conditions were less favourable than usual as showers and high winds caused extensive lodging and rendered difficult the work of threshing, drying and cleaning the grain. There was also a shortage of additional labour. Yields on the whole were good, but there was some loss of grain owing to lodging in the soft soil areas.

In Province Wellesley North reaping was continued but was somewhat retarded by deep water in the padi fields. Yields were expected to be good. Reaping was also in progress in Province Wellesley Central and in the South West District of Penang Island. Measured plots in the Central District gave yields of 300 to 360 gantangs per acre. Good yields were being obtained in the Island.

In Krian harvest was commenced in some localities, more especially Briah and Bagan Serai mukims. Rain delayed the drying of the fields after the water was drained away and also delayed ripening. Lodging has not been extensive, while up to the present additional labour for the harvest has caused no difficulty. Harvest was also in progress in the Kinta District of Perak and in the riverine areas of Lower Perak District where yields were on the whole good. Reaping of a moderate crop was completed in Batang Padang District. In most other parts of the State the crop was maturing and making good progress, but a further examination of the Sungei Manik areas showed that growth is uneven.

In the Panchang Bedena area of Selangor further transplanting brought the planted area to approximately 9,000 acres. Growth was good.

In Jelebu District of Negri Sembilan harvest was finished but yields were only fair. In Seremban, Rembau and part of Kuala Pilah District harvest was in progress.

In Malacca harvest was in full progress, except in the coastal area of Jasin District. Water in the fields hampered the work, but there was no difficulty in obtaining the necessary additional labour.

In Raub and Lipis Districts of Pahang harvest was in progress except in the riverine padi fields below Kuala Lipis where, as in Temerloh District, it was finished. In the Sungei Blat area of Kuantan District about 485 acres were planted and the condition of the crop was fairly satisfactory. During the month the Temerloh mill was able to purchase enough grain for about one week's work, but considerable further supplies were anticipated.

In Kelantan the dry padi crop was being harvested in Kota Bharu District. Both wet and dry padi were growing well and luckily suffered little damage from the severe storm which occurred in the middle of the month.

With the possible exception of Kelantan the crop for the present season is expected to be somewhat below that of 1935 in almost all of the important padi-growing areas. The price, however, has shown a little improvement.

Rubber.—Increases in the quantity of rubber sold by small-holders were reported from most parts of the country in January. This was due to the new issue of coupons and the need for money for the Chinese New Year holiday. Much of the increased output must, however, have been obtained in the second half of the previous month because on the whole there was a decrease in the number of small holdings tapped during January. The new issue of coupons, the improved price, and the impending holiday tended to increase tapping in the early part of the month, but this tendency was offset by the effect of wet weather, work on the padi harvest, the high price of coupons, which sold for around $23 per picul of export rights, and in the second half of the month by the Chinese New Year holiday itself.

Practically throughout the Peninsula rubber trees commenced to winter at the end of the month.

Several new small smoke cabinets were erected and some of these were brought into use and produced smoked sheet of fairly good quality, although there was often room for greater care in the preparation of the sheet before smoking.

Copra.—The steady and progressive improvement in the copra market has been responsible for an appreciable increase in the price of nuts and copra. There was, however, a relatively greater increase in the price of nuts, as the seasonal shortage continued in most areas, except Selangor, and the demand for domestic purposes was good.

In Johore the rise in price stimulated interest in copra production and in the manufacture of copra of better quality attended by renovation of kilns

in Batu Pahat District. An examination of numerous kilns in the Benut area showed that plank walls predominate, but that zinc or even asbestos sheets are frequently used. With slight improvements, costing but little, thoroughly dried copra could easily be produced. Discolouration of the copra is mainly due to the method of handling the nuts. In order to lessen bulk for transport in the drains, nuts are husked and split some miles from the kiln and, when the water in the drains is low, may not reach the kiln until two days after splitting. By that time slimes have formed on the meat which discolour the resulting copra and render impossible the preparation of a product of first quality. Producers are loath to alter their methods in order to overcome the defect of discolouration, but if splitting could be postponed it seems that the sacrifice of quantity would be more than repaid by improvement in quality.

Pineapples.—Supplies of fruit in Johore and Singapore decreased in quantity and deteriorated in quality during the month. Towards the end of the month factories in Johore were working for only two or three days each week. Prices for fresh fruits declined, being for 1st quality $2.50 to $3.10, for 2nd quality $2 to $2.80 and for 3rd quality $1 to $1.95 per hundred.

Fruits.—Good crops of the common tree fruits such as durians, mangosteens, rambutans, pulasans, langsats and mata kuching continued to be collected in Perak, Selangor and Pahang. In Negri Sembilan, however, the fruit crop was poor, providing only small quantities of durians and langsats. There was a large export of durians and rambutans from Larut District to Province Wellesley and Kedah. Exports of bananas and pineapples from Negri Sembilan to Selangor and of bananas from Batu Pahat District to Singapore were well maintained.

Tuba.—There has been a lively interest recently in the cultivation of this crop attended by considerable extension of the planted area in Perak South. In Malacca a number of local requests for planting material of *Derris elliptica* were being met from the ample supplies available at the Sungei Udang Agricultural Station. Considerable quantities of cuttings continued to be exported to Singapore at a price of $6 per 1,000 from the Ayer Hitam area of Batu Pahat District in Johore. Growers in Negri Sembilan were importing supplies of cuttings from cultivators at Nyior in Kluang District. The sale of cuttings from these areas in Johore is sufficiently remunerative to cause stealing at night on a considerable scale. In such cases it is difficult to detect the culprits, but twenty arrests were made during the month. From Singapore over 470,000 cuttings were exported in five consignments.

Agricultural Stations and Padi Test Plots.

By the end of the month reaping was completed on the Telok Chengai Station and the Langgar and Rantau Panjang Plots in Kedah, Kajang and Kuang Plots in Selangor, Kuala Klawang Plot in Negri Sembilan and Temerloh Plot in Pahang. As stated elsewhere, harvest conditions were not ideal in several parts of the country, while heavy winds and rain caused somewhat extensive lodging on some of the plots.

On the Jitra Plot in Kedah yields were good, especially those of Mayang Ebus 80 and 88. At Kajang the varieties Kelantan and Acheh did well, each giving yields of over 500 gantangs per acre which is a high return for this area. On the Bawang Plot in Pekan District of Pahang Siam 29, Nachin 66, Reyong 20 and Radin Siak 24 did well. At the Jementah Plot in Johore floods, pest damage and wet weather at harvest caused extensive losses of crop, but in spite of this, yields of over 300 gantangs per acre were recorded as follows :— Nachin 66, 300; Radin 2, 344; Siam 29, 350 and Siam 76, 390 gantangs per acre, while of the local varieties Serendah Kuning gave 340 and Lembut Tembiling 451 gantangs per acre.

At the new Agricultural Stations, Ayer Itam in Penang, and Raub in Pahang, progress was made in planting permanent crops, tea and coffee at the former, and tea, pepper and citrus at the latter. Vegetable beds were laid out and the pineapple plot was planted at Bukit Kallam Station in Brunei.

In connexion with the propagation of fruit trees, it is reported that at Sungei Udang Station in Malacca 166 marcots were made of citrus, chiku, rambutan and pulasan, while some success attended the budding of durians. At the Pinneapple Station in Singapore jack fruit were budded on chempedak and Mediterranean sweet orange on sour orange stocks. Rambutans are propagated by etiolation, budding and in-arching. The latter method is reported to be more satisfactory than budding, as the high loss on potting budded stock is avoided. Budding of rambutans at Selama Station in Perak proved unsuccessful, although the buds remained green for several weeks.

At Kuantan Agricultural Station in Pahang improvement of the drainage system has been completed and has resulted in better growth of the crops. At the Cheras Station in Selangor the first crop of tea was plucked and prepared by the Chinese method.

Agricultural Instruction.

The second term at the Farm School at Malacca commenced on the 2nd January with 24 pupils. The school is now equipped with a shed for rubber manufacture by methods suitable for small holdings, a rubber smoke cabinet of the approved type and a model copra kiln. It was inspected by the Principal of the School of Agriculture, Malaya, on January 6th to 8th and received a satisfactory report.

As is usual at the approach of harvest, demonstrations were given to Malay headmen and padi growers on Padi Stations and Test Plots in various parts of the country.

Preliminary demonstrations of the use of the *tajak** and the Malacca plough in preparing padi land for planting were given in the riverine padi areas of the Lipis District below Kuala Lipis.

The Rural Lecture Caravan visited nine centres in the Ulu Langat and Kuala Langat Districts of Selangor during the period 14th January to 2nd February. Attendances were good.

* An implement resembling a heavy short-bladed scythe, mounted on a straight wooden handle, used for cutting weeds in wet areas.

DEPARTMENTAL NOTES.

Visit of the Adviser on Agriculture.

At the request of the Government concerned, the Adviser on Agriculture visited Johore from 18th to 23rd January 1936. He conferred with the General Adviser, Johore, the Agricultural Officers, other officials and leading resident unofficials and visited all parts of the State.

Appointments.

Major C. D. V. Georgi, O.B.E., B.Sc., F.I.C., Assistant Chemist, Department of Agriculture, Straits Settlements and Federated Malay States has been appointed Chemist, Department of Agriculture, Straits Settlements and Federated Malay States, with effect from the 1st November 1935 inclusive.

Mr. W. J. Johnson, B.SC., A.C.G.I., has been appointed Canning Officer, Department of Agriculture, Straits Settlements and Federated Malay States, from 20th December, 1935. Mr. Johnson arrived in Malaya and assumed duty on 16th January, 1936.

Leave.

Mr. J. N. Milsum, Senior Assistant Agriculturist, returned from leave on 26th January, 1936.

Mr. R. B. Jagoe, Assistant Botanist, has been granted 8 months and 8 days leave from 11th January to 18th September 1936 inclusive.

Mr. B. Bunting, Agriculturist, has been granted 9 months and 2 days leave from 30th January to 31st October 1936.

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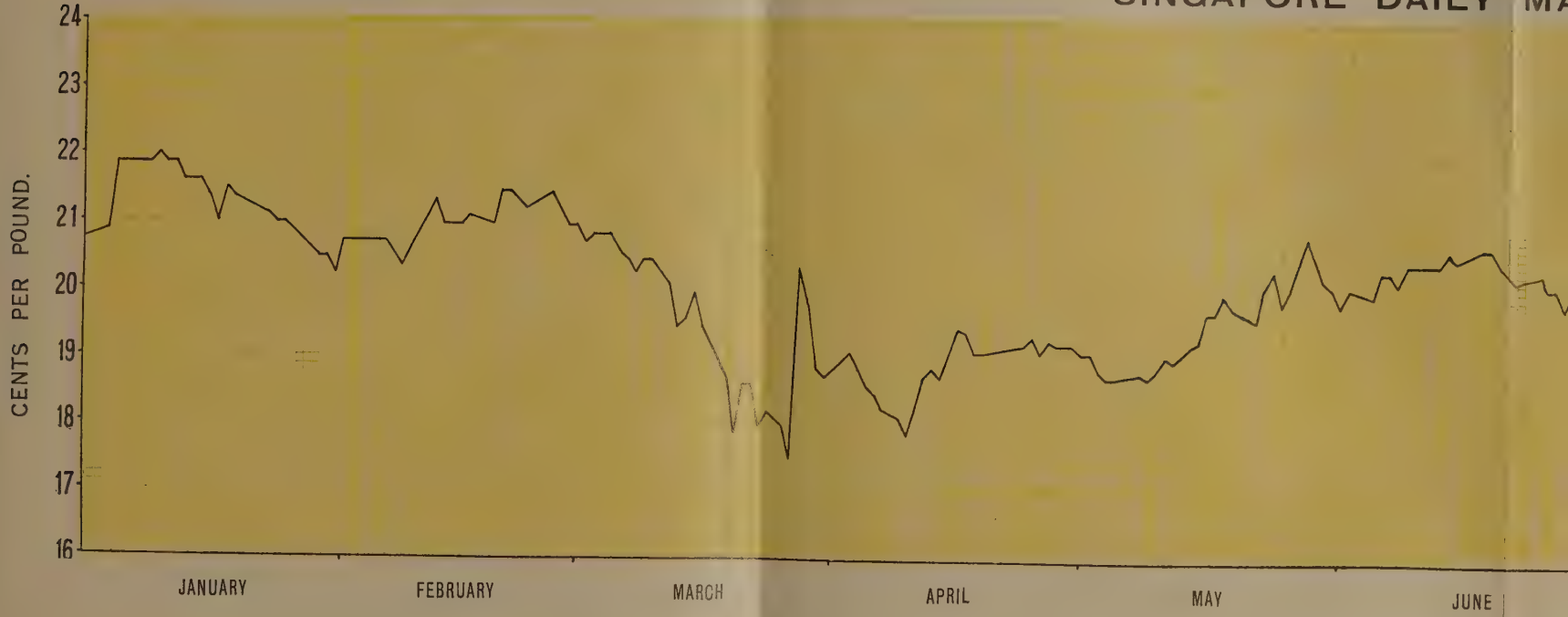

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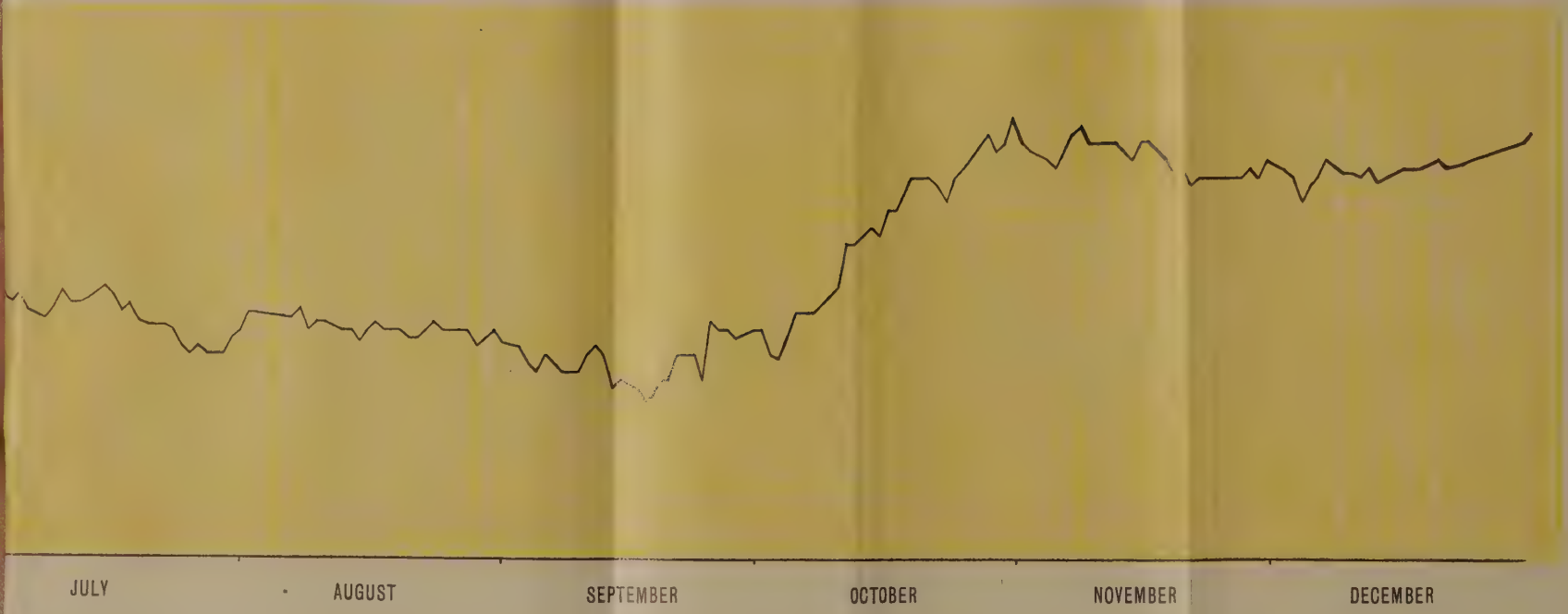
KET PRICES 1935

Supplement to
The Malayan Agricultural Journal, February 1936.



Statistical.

MARKET PRICES.

January, 1936.

Rubber.—The market improved considerably during the month. Spot loose opened in Singapore at 22⅜ cents per lb. and rose to 24¼ cents on the 27th January, closing at 24 cents. The average price for the month for No. 1 X Rubber Smoked Sheet was 23.41 cents per lb. as compared with 21.74 cents in December. The average price in London was 6.76 pence per lb. and in New York 14.20 cents gold as compared with 6.33 pence and 13.05 cents gold in December.

Prices paid for small-holders' rubber at three centres during the month are shewn in the following table.

Table I.

Weekly Prices Paid By Local Dealers for Small-Holders' Rubber, January, 1936.

(Dollars per Picul.)

Grades.	Kuala Pilah, Negri Sembilan.					Kuala Kangsar, Perak.				Batu Pahat, Johore.
	2	9	16	23	30	8	15	22	29	15
Smoked sheet	27.13	28.06	30.00	29.46	30.01	28.65	29.07	29.98	29.85	
Unsmoked sheet	26.00	27.24	28.83	28.00	28.45		28.00			28.00
Scrap			25.00		26.00					

Transport by F. M. S. R. lorry service Kuala Pilah to Seremban 12 cents per picul, to Malacca excluding duty, 25 cents per picul, by rail Seremban to Penang $1.24 per picul, Seremban to Singapore $8.00 per ton.

Transport from Batu Pahat to Singapore by lorry excluding duty, 90 cents per picul.

Transport from Kuala Kangsar to Prai by railway $6.20 per ton.

Transport from Kuala Kangsar to Singapore by railway $10.00 per ton (minimum consignment 5 tons).

At Kuala Pilah the standard deduction for moisture in unsmoked sheet is 5 per cent.

At Kuala Kangsar the standard deduction for moisture in unsmoked sheet is 10 per cent

No purchases at Batu Pahat on the 1st, 8th, 22nd and 29th January, and at Kuala Kangsar on the 1st January.

Palm Oil.—Prices quoted during January for the Malayan commodities are given in the following table.

Table II.

Prices of Palm Oil and Palm Kernels.

Date 1936.	Palm Oil in Bulk, c i.f. landed weight Liverpool/ Halifax.	Palm Kernels, c.i.f. landed weight London/ Continent
	per ton	per ton
Jan. 3	21. 0. 0	10. 17. 6
„ 10	20. 10. 0	10. 17. 6
„ 17	20. 10. 0	11. 10. 0
„ 24	20. 10. 0	11. 17. 6
„ 31	21. 15. 0	10. 16. 3

Copra.—This market was noticeable for a steady and considerable improvement in price maintained throughout the month. The sun-dried grade opened in Singapore at $5.90 per picul rising to $6.60 at the close. The average price for the month was $6.08, per picul as compared with $5.46 in December. The mixed quality shewed a similar improvement, averaging $5.51 per picul as compared with $4.89 in the previous month.

Copra cake remained unchanged at $1.40 per picul.

Rice.—The average wholesale prices of rice per picul in Singapore for December were as follows:—Siam No. 2 (ordinary) $3.62, Rangoon No. 1 $3.57, Saigon No. 1 $3.32, as compared with November corresponding prices of $3.89, $3.74 and $3.55. The corresponding prices in December 1934 were $2.95, $2.85 and $2.95.

The average retail market prices in cents per gantang of No. 2 Siam rice in December were:—Singapore 32, Penang 30, Malacca 27, as compared with 31, 31 and 27 respectively in November. The averages for the year were 30, 24, 27 respectively as compared with 23, 24, 24 for 1934.

The average declared trade value of imports of rice in December was $3.63 per picul, as compared with $3.66 in November and $3.80 in October. The average for the year was $3.65 as compared with $3.15 in 1934.

Padi.—The Bagan Serai Government Mill in Krian reduced the price for padi to $1.65 per picul, and a local mill was offering $1.55; Chinese buyers in that District were offering the equivalent of $1.95 to $2 per picul at the road side. The price at the Temerloh mill was $2 per picul. Chinese dealers bought part of the crop in the Central District of Malacca at $1.60 per picul.

Retail prices of padi varied between 6½ and 14 cents per gantang.

Tea.—During January thirteen consignments of Malayan tea were sold on the London market. Two consignments were of highland tea, and averaged 1s. 0¾d. per lb.; the remaining consignments were of lowland tea, and were sold at prices ranging from 11½d. to 1s. 0¼d. per lb., the average price being 1s.0.02d.

Average London prices per lb. during the month for tea consignments from other countries were as follows:— Ceylon 1s.1.91d., Java 11.04d., Indian Northern 1s.0.99d., Indian Southern 1s.0.8d., Sumatra 10.49d.

The latest Colombo average prices available are quoted from the *Weekly Tea Market Report,* 27th January, 1936, of the Colombo Brokers' Association, and are as follows (rupee cents per lb.):— High Grown Teas 79 cents, Medium Grown Teas 68 cents, Low Green Teas 64 cents.

Tuba Root (*Derris*).—Prices fell in Singapore during January resulting in an increased demand. Roots sold on rotenone content averaged $45 per picul as compared with $48 in the previous month, and roots sold on a basis of ether extract fell to $28 per picul from $30 in December.

Coffee.—Sourabaya coffee improved slightly in Singapore in comparison with the previous month. The market opened and closed at $13 to $14 per picul, but fell in the middle of the month to $12.50 to $13.50. Palembang coffee weakened considerably, the average price for the month falling to $6.81 per picul as compared with $7.25 in December.

Locally grown coffee varied between $15 and $25 per picul according to quality.

Arecanuts.—The Singapore market improved slightly during January. Average prices per picul were:—Splits $4.75 to $6.85; Sliced $7.65 to $8.75; Red Whole $6.65 to $7.75.

The Singapore Chamber of Commerce average prices per picul were:— Best $6.52, Medium $6.07, Mixed $4.99.

Gambier.—Prices per picul in Singapore remained unchanged throughout the month at $6.50 for Block and $10 for No. 1 Cube. The December average prices were $6.75 and $10 respectively.

Pineapples.—The market is steady with not much business passing. Prices were reduced during the month, the average prices per case being Cubes $3.50, Sliced Flat $3.30, Sliced Tall $3.44, as compared with $3.55, $3.35 and $3.50 respectively in December.

Prices for fresh fruits declined being: 1st quality $2.50 to $3.10, 2nd quality $2 to $2.80, 3rd quality $1 to $1.95 per 100.

Tapioca.—Prices per picul remained unchanged throughout January in Singapore at the following levels: Flake Fair $5.50, Seed Pearl $5.50, Medium Pearl $6.50. The December average prices were $5.69, $5.69 and $6.50 respectively.

Sago.—Pearl, Small Fair, continued unchanged at $3.75 per picul, but Flour, Sarawak Fair, fell still further, averaging $2.50 per picul as compared with $2.59 in December.

Mace.—Siouw improved to $105 per picul, remaining unchanged at this price throughout the month, as compared with $100 in December. Amboina also improved, the price rising to $75 per picul, with an average for the month of $74.50 as compared with $70 in December.

Nutmegs.—Singapore prices fell in the second half of January, but average prices shewed an improvement over the previous month. January averages per picul were: 110's $35.50, 80's $36, as compared with $34.50 and $35.50 in the previous month.

Pepper.—Prices in Singapore were marked up slightly, but little business was reported. Average prices per picul for the month were: Singapore Black $9.06, Singapore White $16.88, Muntok White $17.38, as compared with $9, $16.50 and $17 respectively in December.

Cloves.—Nominal Singapore prices remained unchanged at $37 per picul for both Zanzibar and Amboina.

Cardamoms.—According to the Ceylon Chamber of Commerce weekly reports green cardamoms were quoted during January at 95 rupee cents to R. 1.06 per lb. rising to close at R. 1 to R. 1.17.

Tobacco.—Prices for cured leaf per picul were as follows:— 1st quality $25 to $60, 2nd quality $12 to $40, 3rd quality $10 to $25. In Port Dickson, Negri Sembilan, very high prices were again recorded, the range being $75 to $90, $35 to $80, $15 to $75. In Kelantan also, prices were high, 2nd quality being $80, and 3rd quality $40 per picul.

The above prices are based on London and Singapore daily quotations for rubber; on the Singapore Chamber of Commerce Weekly Reports for the month and on other local sources of information. Palm oil reports are kindly supplied by Messrs. Guthrie & Co. Ltd., Kuala Lumpur; the Singapore prices for coffee and arecanuts by the Lianqui Trading Company of Singapore, and tuba prices by Messrs. Mackay & Co., Singapore.

1 picul = 133⅓ lbs. The Dollar is fixed at two shillings and four pence.

Note.—The Department of Agriculture will be pleased to assist planters in finding a market for agricultural produce. Similar assistance is also offered by the Malayan Information Agency, 57, Charing Cross. London, S.W.1.

GENERAL RICE SUMMARY.*

December, 1935.

Malaya.—Imports of foreign rice during December were 40,674 tons, and exports 16,037 tons, net imports being 24,637 tons. The total net imports for the year were 470,384 tons as compared with 453,229 tons in 1934.†

Of the imports during December, 54 per cent. were consigned to Singapore, 13 per cent. to Penang, 7 per cent. to Malacca, 21 per cent. to the Federated Malay States, and 5 per cent. to the Unfederated Malay States. Of the total, 72 per cent. came from Siam, 23 per cent. from Burma, 4 per cent. from French Indo-China, and 1 per cent. from other countries.

Of the exports during December, 72 per cent. were consigned to the Netherlands Indies, and 28 per cent. to other countries. The various kinds of rice exported were: Siam 13,191 tons (82.3 per cent.), Burma 2,006 tons (12.5 per cent.), French Indo-China 757 tons (4.7 per cent.), parboiled rice 44 tons (0.3 per cent.), local production 39 tons (0.2 per cent.)

India and Burma.—Foreign exports for the eleven months January to November, 1935, totalled 1,591,000 tons, as compared with 1,327,000 tons in 1934, an increase of 19.9 per cent. Of the 1935 exports 3.8 per cent. were to the United Kingdom, 9.6 per cent. to the Continent of Europe, 25.5 per cent. to Ceylon, 31.3 per cent. to the Straits Settlements and Far East, and 29.8 per cent. to other countries. The corresponding 1934 percentages were: 8.4, 17.9, 25.6, 20.0, and 28.1.

Burma's total exports of rice and bran (*Bangkok Times*, 21st November, 1935) from January to November 1935 aggregated 3,262,823 metric tons, as compared with 3,630,041 metric tons in 1934, a decrease of 10.1 per cent.

According to the third forecast of the rice crop in Burma for the season 1935-36, the area likely to mature is estimated to be 12,226,100 acres, or 123,800 acres less than the previous season's final figure. The decrease is, however, likely to be considerably overbalanced by the better condition of the crop.

The exportable surplus of the 1935-36 harvest is estimated at 3,600,000 tons of rice and rice products.

Siam.—Exports of rice and rice products from Bangkok during November were 139,184 tons (provisional). The cumulative total for the year is 1,408,072 tons as compared with 1,716,236 tons in 1934.

Japan.—No further information is available since the November Summary.

French Indo-China.—Entries of padi into Cholon during 1935 totalled 1,584,232 metric tons, as compared with 1,581,481 metric tons in 1934, an increase of 0.2 per cent. Exports of rice for the same period were 1,718,013 metric tons, an increase of 9.0 per cent.

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* Abridged from the Rice Summary for December, 1935, compiled by the Department of Statistics, Straits Settlements and Federated Malay States.

† It is to be understood throughout the summary that all comparisons and percentage increases or decreases are in relation to the corresponding period of 1934.

Netherlands Indies.—No further information is available since the November Summary.

Ceylon.—Imports for the year 1935 totalled 533,253 tons as compared with 477,631 tons in 1934, an increase of 11.6 per cent.

Of these imports 12.9 per cent. were from British India, 65.2 per cent. from Burma, 0.7 per cent. from the Straits Settlements, and 21.2 per cent. from other countries. The corresponding percentages for 1934 were 14.2, 61.5, 1.8 and 22.5.

Europe and America.—For the period 1st January to 19th December 1935 shipments from the East to Europe aggregated 750,718 tons, as compared with 1,172,063 tons in 1934, a decrease of 35.9 per cent. Of the 1935 shipments 43.4 per cent. were from Burma, 3.2 per cent. from Japan, 46.1 per cent. from Saigon, 5.9 per cent. from Siam, and 1.4 per cent. from Bengal. The 1934 corresponding percentages were 33.4, 4.0, 51.1, 9.7 and 1.8.

Shipments for the Levant from 1st January to 25th November, 1935, were 28,895 tons, an increase of 2.2 per cent. as compared with 1934.

Shipments for Cuba, West Indies and America from 1st January to 6th December, 1935, totalled 248,202 tons, an increase of 36.6 per cent. as compared with 1934.

MALAYAN AGRICULTURAL EXPORTS, DECEMBER, 1935.

PRODUCT.	Net Exports in Tons.			
	Year 1934.	Year 1935	December 1934	December 1935
Arecanuts ...	27,336	21,885	1,560	2,248
Coconuts, fresh † ...	100,804†	100,428†	11,039†	2,808†
Coconut oil ...	25,485	35,911	2,347	3,905
Copra ...	95,599	111,752	8,925	16,297
Gambier, all kinds ...	2,170	2,837	144	180
Oil cakes ...	11,273	11,361	676	1,506
Palm kernels ...	3,196	3,892	425	355
Palm oil ...	15,852	24,996	797	2,047
Pineapples canned ...	66,634	73,923	4,840	8,866
Rubber ¶ ...	479,371¶	378,497¶	52,500¶	25,322¶
Sago,—flour ...	10,403	10,920	1,944	2,430
„ —pearl ...	5,058	4,655	1,683	388
„ —raw ...	7,079*	7,735*	753*	820*
Tapioca,—flake ...	5,761	1,953	169	153
„ —flour ...	1,842*	755*	56*	150*
„ —pearl ...	15,770	17,169	1,425	1,479
Tuba root ...	481	567	20	48

† hundreds in number. * net imports. ¶ production.

MALAYAN PRODUCTION (IN TONS) OF PALM OIL AND KERNELS

(As declared by Estates)

Month 1935	Palm Oil		Palm Kernels	
	F.M.S.	U.M.S.	F.M.S.	U.M.S.
January, ...	1,062.3	339.3	174.0	49.6
February ...	977.4	220.9	161.7	38.5
March ...	1,104.3	334.2	172.6	48.6
April ...	1,008.2	328.0	151.2	40.4
May ...	1,077.1	461.8	158.6	63.1
June ...	1,311.0	724.1	200.9	105.5
July ...	1,901.2	729.0	255.3	109.0
August ...	2,331.5	777.9	345.5	120.0
September ...	2,080.0	607.4	231.3	87.7
October ...	1,869.8	512.8	306.5	54.4
November ...	1,464.3	400.5	280.1	58.4
December ...	1,151.6	328.7	273.4	43.2
Total 1935 ...	17,338.7	5,764.6	2,711.1	818.4
Total for year 1934 ...	12,965.0	4,510.0	2,013.0	795.0

ACREAGES OF TAPPABLE RUBBER NOT TAPPED ON ESTATES OF 100 ACRES AND OVER, FOR THE MONTH ENDING 31ST DECEMBER, 1935.

STATE OR TERRITORY	Acreage of Tappable Rubber end 1934	ESTATES WHICH HAVE ENTIRELY CEASED TAPPING		ESTATES WHICH HAVE PARTLY CEASED TAPPING (*a*)		AREA OF TAPPABLE RUBBER NEVER BEEN TAPPED		Total (3) + (5)	Percentage of (9) to (2)
		Acreage	Percentage of (3) to (2)	Acreage	Percentage of (5) to (2)	Acreage	Percentage of (7) to (2)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
STRAITS SETTLEMENTS :—									
Province Wellesley	44,691	484	1.1	14,121	31.6	592	1.3	14,605	32.7
Malacca	123,793	1,730	1.4	29,340	23.7	3,354	2.7	31,070	25.1
Penang Island	2,593	9	.4	460	17.7	124	4.8	469	18.1
Singapore Island	33,312	3,014	9.0	7,445	22.4	614	1.8	10,459	31.4
Total S.S. ...	204,389	5,237	2.6	51,366	25.1	4,684	2.3	56,603	27.7
FEDERATED MALAY STATES :—									
Perak	295,895	10,400	3.5	60,288	20.4	11,401	3.8	70,688	23.9
Selangor	345,100	11,093	3.2	66,842	19.4	12,274	3.6	77,935	22.6
Negri Sembilan	258,381	12,420	4.8	48,608	18.8	13,364	5.2	61,028	23.6
Pahang	75,912	9,262	12.2	23,665	31.2	12,546	16.5	32,927	43.4
Total F.M.S. ...	975,288	43,175	4.4	199,403	20.5	49,585	5.1	242,578	24.9
UNFEDERATED MALAY STATES :—									
Johore	417,633	21,090	5.0	70,018	16.8	35,587	8.5	91,108	21.8
Kedah	199,180	3,880	1.9	22,423	11.3	19,349	9.7	26,303	13.2
Kelantan	28,891	403	1.4	8,964	31.0	4,560	15.8	9,367	32.4
Trengganu (*b*)	4,643	Nil	Nil	15	0.3	5	0.1	15	0.3
Perlis (*c*)	1,206	Nil	Nil	719	59.6	64	5.3	719	59.6
Brunei	(*d*) 4,991	Nil	Nil	1,607	32.2	841	16.8	1,607	32.2
Total U.M.S. ...	656,544	25,373	3.9	103,746	15.8	60,406	9.2	129,119	19.7
TOTAL MALAYA ...	1,836,221	73,785	4.0	354,515	19.3	114,675	6.2	428,300	23.3

Notes :—(*a*) Area out of tapping on Estates which have partly ceased tapping refers to areas definitely being rested and excludes areas on any tapping round.
(*b*) Registered Companies only.
(*c*) Rendered quarterly.
(*d*) Acreage of tappable rubber on 1st May, 1934.

MALAYA RUBBER STATISTICS — TABLE I

STOCKS, PRODUCTION, IMPORTS AND EXPORTS OF RUBBER, INCLUDING LATEX, CONCENTRATED LATEX AND REVERTEX, FOR THE MONTH OF DECEMBER, 1935, IN DRY TONS.

State or Territory	Stocks at beginning of month 1			Production by Estates of 100 acres and over		Production by Estates of less than 100 acres estimated 2		Imports				Exports including re-exports				Stocks at end of month			Consumption 3	
								during the month		Jan. to Dec. inclusive 1935		during the month		Jan. to Dec. inclusive 1935						
	Ports	Dealers	Estates of 100 acres and over	during the month	January to Dec. inclusive 1935	during the month	January to Dec. inclusive 1935	Foreign	From Malay States & Labuan	Foreign	From Malay States & Labuan	Foreign	Local	Foreign	Local	Ports	Dealers	Estates of 100 acres and over	during the month	January to Dec. inclusive 1935
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
MALAY STATES :—																				
Federated Malay States ...	...	7,953	10,864	10,893	133,067	2,736	67,380	Nil	Nil	17	Nil	9,983	3,930	*161 972 †150,022	47,139	...	5,337	13,187	9	108
Johore ...	...	1,657	3,823	3,841	48,967	1,159	35,850	Nil	13	Nil	181	1,827	2,812	29,772	53,587	...	1,632	4,222	...	...
Kedah ...	...	299	2,579	2,642	30,637	542	10,990	Nil	Nil	Nil	Nil	1,217	1,280	17,709	22,121	...	181	3,384	...	...
Perlis ...	...	17	11	13	131	6	214	Nil	Nil	Nil	Nil	Nil	23	Nil	360	...	7	17	...	...
Kelantan ...	...	393	274	238	3,882	183	5,558	Nil	Nil	Nil	Nil	71	466	1,980	7,243	...	212	339	...	...
Trengganu ...	...	55	50	101	3,021	51	1,512	Nil	Nil	Nil	Nil	Nil	152	Ni	4,533	...	55	50	...	...
Brunei	...	11	43	59	628	73	737	...	...	...	...	...	133	...	1,338	...	3	50	...	...
Total Malay States	...	10,385	17,644	17,787	220,333	4,750	122,241	Nil	13	17	181	13,098	8,796	211,433	136,321	...	7,427	21,249	9	108
S. SETTLEMENTS :-																				
Malacca ...	...	2,378	1,145	1,078	14,618	342	7,407	Nil		Nil		2,172		31,025		...	1,308	1,406	...	...
Province Wellesley	...	1,989	449	467	5,640	168	2,817	Nil		Nil		7,976		89,278		...	1,691	610	...	...
Penang ...	3,173	6,069	13	17	195	150	1,297	2,875	8,714	26,762	135,120		Nil		Nil	2,250	5,925	9	...	...
Singapore ...	2,911	20,444	169	147	2,096	278	1,555	4,579		146,843		14,592		258,575		3,669	16,460	160	58	485
Labuan	...	25	Nil	Nil	Nil	22	182	75		1,030		Nil		Nil		...	39	Nil	...	...
Total Straits Settlements	6,084	30,905	1,776	1,709	22,549	960	13,258	7,529	8,714	174,635	135,120	24,740	Nil	378,886	Nil	5,919	25,423	2,185	58	485
TOTAL MALAYA	6,084	41,290	19,420	19,496	242,882	5,710	135,499	7,529	8,727	174,652	135,301	37,838	8,796	590,319	136,321	5,919	32,850	23,434	67	593

*Ocean shipments from Malaya of rubber directly consigned from the F.M.S. † Exports of rubber from the F.M.S.

TABLE II
DEALERS' STOCKS, IN DRY TONS 3

Class of Rubber	Federated Malay States	S'pore	Penang	Province We'sly D'dings M'cca	Johore	Kedah
22	23	24	25	26	27	28
DRY RUBBER	4,733	16,067	5,406	2,912	1,460	139
WET RUBBER	604	393	519	129	172	42
TOTAL ...	5,337	16,460	5,925	3,041	1,632	181

TABLE III
FOREIGN EXPORTS

PORTS 29	For month 30	January to Dec. 1935 31
Singapore ...	22,585	386,304
Penang ...	11,002	136,041
Port Swettenham.	3,953	63,815
Malacca ...	298	4,159
MALAYA ...	37,838	590,319

TABLE IV
DOMESTIC EXPORTS 4

AREA 32	For month 33	January to Dec. 1935 34
Malay States ...	24,894	335,503
Straits Settlements	2,611	35,079
MALAYA ...	24,505	370,582

Notes:—
1. Stocks on estates of less than 100 acres and stocks in transit on rail, road or local steamer are not ascertained.
2. The production of estates of less than 100 acres is estimated from the formula: Production + Imports + Stocks at beginning of month = Exports + Stocks at end of month. + Consumption, *i.e.*, Column [7] = Columns [13] + [14] + [17] + [18] + [19] + [20] − [2] − [3] − [4] − [5] − [9] − [10]. For the Straits Settlements the production of estates of less than 100 acres is represented by sales or exports as shown by cess paid.
3. Dealers' stocks in the Federated Malay States are reduced to dry weights by the following fixed ratios: unsmoked sheet, 15% wet sheet, 25% scrap, lump, etc., 40%; stocks elsewhere are in dry weights as reported by the dealers themselves.
4. Column (33) and (34) represent exports of rubber subject to regulation which, for Singapore and Penang Islands are represented by sales or exports as shown by cess paid.
5. All statements are brought up to date monthly, and any inaccuracies that may be disclosed are corrected in the totals; the latest publication, therefore, is always the most reliable.
6. The above, with certain omissions, is the Report published by the Registrar-General of Statistics, S.S. and F.M.S., at Singapore on 23 January, 1936.

METEOROLOGICAL SUMMARY, MALAYA, DECEMBER, 1935.

Locality.	Air Temperature in degrees Fahrenheit							Earth Temperature		Rainfall							Bright Sunshine.		
	Means of			Absolute Extremes									Number of days.						
	A. Max.	B. Min.	Mean of A and B.	Highest Max.	Lowest Min.	Lowest Max.	Highest Min.	At 1 foot	At 4 feet	Total.		Most in a day. Amt.	Precipitation .01 in or more	Precipitation, .04 in or more	Thunder-storm	Fog morning obs.	Gale force 8 or more	Total.	Daily Mean.	Per cent.
	°F	°F	°F	°F	°F	°F	°F	°F	°F	in.	mm.	in.						Hrs.	Hrs.	
Railway Hill, Kuala Lumpur, Selangor ...	89.6	71.6	80.6	93	70	85	74	83.7	84.3	10.32	262.1	1.95	21	18	3	9		167.75	5.41	45
Bukit Jeram, Selangor ...	87.1	71.9	79.5	90	70	84	74	82.2	84.5	12.19	309.6	3.20	23	18	4	3		191.10	6.16	52
Sitiawan, Perak ...	87.4	72.8	80.1	90	71	84	75	82.7	83.5	7.15	181.6	1.20	22	19				210.05	6.77	57
Temerloh, Pahang ...	85.9	71.9	78.9	91	70	76	73	83.2	84.9	10.26	260.6	1.92	25	22	2	5	1	149.85	4.83	41
Kuala Lipis, Pahang ...	86.0	71.0	78.5	91	68	76	73	82.1	83.4	12.03	305.6	3.01	24	18	3	19		154.05	4.97	42
Kuala Pahang, Pahang ...	83.9	73.5	78.7	86	72	79	76	81.8	84.1	25.31	642.9	4.78	24	19			1	176.50	5.69	48
Kallang Aerodrome, S'pore ...	84.8	74.5	79.7	89	72	77	76	81.0	82.1	9.39	238.5	1.53	19	17	5			153.60	4.95	41
Butterworth, Province Wellesley ...	86.7	72.6	79.7	90	70	79	76	84.0	84.8	6.45	163.8	1.63	14	13				220.05	7.10	60
Bayan Lepas Aerodrome, Penang ...	86.8	73.6	80.2	90	72	79	77	82.8	83.4	6.05	153.7	0.78	19	17	2			218.60	7.05	60
Bukit China, Malacca ...	84.5	73.0	78.7	89	71	77	75	82.0	83.1	7.94	201.7	1.80	20	17	1		2	191.35	6.17	51
Kluang, Johore ...	85.9	70.8	78.3	91	67	73	73	80.8	81.9	9.53	242.1	1.68	20	18	2	15		136.45	4.40	37
Bukit Lalang, Mersing, Johore	82.6	71.7	77.1	88	70	75	73	79.8	80.9	30.48	774.2	5.66	25	23	1	1		164.40	5.30	44
Alor Star, Kedah ...	87.8	72.3	80.1	91	69	79	75	83.7	85.2	5.19	131.8	2.08	17	13	6	1		196.45	6.34	53
Kota Bahru, Kelantan ...	83.8	72.9	78.3	88	70	76	74	81.2	83.3	22.94	582.7	3.30	22	21			1	142.25	4.59	39
Kuala Trengganu, Trengganu	84.1	72.9	78.5	88	70	76	77	80.2	81.7	22.51	571.8	3.16	24	22			3	157.75	5.09	43
HILL STATIONS.																				
Fraser's Hill, Pahang 4268 ft.	70.9	61.6	66.3	76	60	63	63	71.1	71.8	15.44	392.2	1.66	29	27		24		118.75	3.83	32
Cameron Highlands, Tanah Rata, Pahang 4750 ft. ...	71.7	56.9	64.3	76	49	64	61	68.7	69.1	10.66	270.8	1.40	22	20			4	117.45	3.79	32
Cameron Highlands, Rhododendron Hill, Pahang 5120 ft. ...	70.7	58.5	64.6	76	56	63	60			10.80	274.3	1.70	23	20			4	128.65	4.15	35

Compiled from Returns supplied by the Meteorological Branch, Malaya